

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 9/15/80

Project Title: WOMEN IN SCIENCE CAREER WORKSHOP

Project No: G-31-611

Project Director: DR. VIRGINIA S. WATTS

Sponsor: NATIONAL SCIENCE FOUNDATION; WASHINGTON, D.C. 20550

Agreement Period: From 6/15/80 Until 1/31/82
(INCLUDES SIX (6) MONTH UNFUNDED FLEXIBILITY PERIOD)

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Reports Required: QUARTERLY PROGRESS REPORTS; FINAL PROJECT REPORT

Sponsor Contact Person (s):

Technical Matters

MS. M. JOAN CALLANAN
NSF PROGRAM OFFICER
WOMEN IN SCIENCE PROGRAM
STUDENT ORIENTED PROGRAMS
DIVISION OF SCIENTIFIC PERSONNEL IMPROVEMENT
NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550
(202) 282-7150

Contractual Matters

(thru OCA)

MR. FRANK GRAVES
NSF GRANTS OFFICIAL
BBS/SE BRANCH
DIVISION OF GRANTS & CONTRACTS
DIRECTORATE FOR ADMINISTRATION
NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550
(202) 357-9843

Defense Priority Rating: NONE

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SPONSORED PROJECT TERMINATION SHEETDate 8/29/83Project Title: Women in Science Career WorkshopProject No: G-31-611Project Director: Dr. Virginia S. WattsSponsor: National Science Foundation; Washington, D. C. 20550Effective Termination Date: 1/31/82Clearance of Accounting Charges: 1/31/82

Grant/Contract Closeout Actions Remaining:

- ☐ Final Invoice and Closing Documents
- ☒ Final Fiscal Report (FCTR, if required at this time. No record of submittal in OCA files.)
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
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- ☐ Other _____

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GEORGIA INSTITUTE OF TECHNOLOGY
COLLEGE OF SCIENCES AND LIBERAL STUDIES
ATLANTA, GEORGIA 30332
(404)894-3300

OFFICE OF THE DEAN

MEMORANDUM

TO: Ms. Joan Callanan, Program Manager, Women in Science
FROM: Virginia S. Watts, Project Director, Science Career Workshop *4/16*
SUBJECT: INTERIM REPORT

Phase I: Workshop

Georgia Tech's Science Career Workshop was conducted September 30th. One hundred-sixty applicants were accepted. Of these one hundred-thirty plus nine walk-ons attended. The ethnic distribution for participants was 68 white, 25 black, and 7 oriental. Thirty one participants did not disclose their ethnicity. The participants distribution with respect to educational background (in terms of highest degree obtained) was 58 high school diploma, 40 bachelors degree, 24 masters degree, and 7 doctoral degree holders. Eleven participants did not provide relevant information. In general, feedback from the workshop has been very positive with a large number of participants expressing need for such experiences and hope that the workshop would be repeated. One hundred-eleven participants returned evaluations producing an overall average rating of very good (i.e. 4.1 on a 5 point scale from poor to outstanding) for the workshop. One man, a chemist, attended. He was very enthusiastic about the experience.

Phase II: Continuing Activity

I have been appointed as special science career advisor for women in the College of Science and Liberal Studies and begun continuing activities, i.e. advising and referring women seeking assistance and identifying professional women willing to serve as mentors. Since September 30th, I have consulted with a number of both participants and women who heard of the workshop but were unable to attend. Besides these women, seventeen off campus participants

Interim Report


have requested career counseling services through our Counseling Center. Four have begun a combined counseling and computer assisted career exploration program and 13 are waiting to begin. I have held one meeting with representatives from Georgia State University, Spelman College, and Agnes Scott College to discuss interinstitutional cooperation in setting up a science career workshop and related activities for next year. And finally, a newsletter to all participants in this years workshop is being prepared and should be sent out within the month.

GEORGIA INSTITUTE OF TECHNOLOGY
COLLEGE OF SCIENCES AND LIBERAL STUDIES
ATLANTA, GEORGIA 30332

OFFICE OF THE DEAN

April 3, 1981

MEMORANDUM

TO: Ms. Joan Callanan, Program Manager, National Science Foundation
FROM: Virginia S. Watts, Project Director, 1979 Science Career Workshop Project
SUBJECT: INTERIM REPORT (3RD QUARTER) 

Phase I: Workshop

No additional significant information is available on the workshop at this time. One rather curious note is that in the six months since the workshop we have continued receiving a few applications from women who seem oblivious to the time of its occurrence. The last one arrived in February. This is hard to understand since all of our advertising contained the workshop date. We are now preparing to begin the proposed six-month follow up contacts with workshop participants. That process should be completed within the next reporting period.

Phase II: Continuing Activity

As science career advisor for women in the College of Sciences and Liberal Studies, I have initiated several efforts, in addition to individual contacts, aimed at increasing the awareness of and information about science careers. These include career presentations to (1) a group of about 50 high school teachers, (2) a group of about 100 high school students and (3) Georgia Tech's student chapter of the Society of Women Engineers. I also set up an evening presentation for Georgia Tech's freshman women but was forced to cancel it due to lack of student interest. Our student SWE chapter has expressed an interest in providing career information to high school students and I have tried to promote this activity by discussing with a group of their members how such a project might be approached. Finally, our counseling center continues to make our computerized career investigation service available to off-campus participants in last fall's workshop. So far, nineteen off-campus participants have contacted the counseling center about this service and seven have availed themselves of it.

/sa

FOLLOW-UP QUESTIONNAIRE,
1980 SCIENCE CAREER WORKSHOP PROJECT

1. Since the workshop, have you contacted any of the participants or presenters as resource persons?
(a) yes 10 (b) no 53 (if no, skip to question 3)
2. What kind of information did you seek from your contact?
(a) 2 information to assist with career selection.
(b) 7 information about job opportunities.
(c) 4 information on requirements for entry into her field of work.
(d) 2 information about career development.
(e) 1 general information about women in professional careers.
(f) 2 other
3. Have you contacted the Georgia Tech counseling center regarding career assistance since the workshop?
(a) yes 11 (b) no 52 (if no, skip to question 6)
4. As a result of the contact did you receive assistance?
(a) yes 7 (b) no 4
5. If you received assistance, how helpful do you consider it? (place an X on the scale)

2	1	2	1	1
5	4	3	2	1
(very helpful)				(of little value)
6. Since the workshop have you initiated any new plan or action relative to your career?
(a) yes 48 (b) no 15 (if no, skip to question 8)
7. If yes, please check all that apply.
(a) 16 taken a course in a math, engineering, or science related subject.
(b) 4 taken a course related to management.
(c) 23 investigated additional professional training. Nursing, Management
Chem., Plant Pathology, IE, Acct.,
(d) 10 applied to graduate school (what field?) Computer Sci., Business, Arch.,
Medicine, Aerospace Eng., Insurance,
(e) 27 investigated a new field/job (what area?) Ch.E., Acct., Research, Airlines, Mar
(f) 14 investigated a different job in current field.
(g) 5 requested a promotion or raise.
(h) 15 other (please describe). (SEE ALL OF THE ABOVE, THEY WERE LISTED HERE TOO)

8. Now, seven months after the workshop, can you identify and rank the three resources you feel most necessary to develop/advance your career? (rank 1 as most needed, 2 as second most needed, 3 as third most needed)
- (a) _____ advanced training in my current field. 1) 19 2) 5 3) 5
 - (b) _____ training in management. 1) 1 2) 9 3) 5
 - (c) _____ retraining in a more employable field. 1) 7 2) 6 3) 1
 - (d) _____ courses to update my professional skills. 1) 2 2) 0 3) 10
 - (e) _____ more information on job options for persons with my background. 1) 22 2) 16
3) 9
 - (f) _____ individual career counseling. 1) 7 2) 4 3) 4
 - (g) _____ more personal contacts with professionals in my field. 1) 5 2) 13 3) 16
 - (h) _____ a mentor. 1) 3 2) 3 3) 2
 - (i) _____ another workshop. 1) 0 2) 1 3) 7
 - (j) _____ day care. 1) 0 2) 2 3) 3

9. In retrospect, was anything not included in the workshop which you feel would have been particularly valuable?

PLEASE SEE THE ATTACHED

10. We are very concerned about the underemployment of women with scientific training. If you are unemployed or underemployed would you help document the problem by describing briefly the reasons (as you perceive them) for your situation and any barriers to its resolution.

PLEASE SEE THE ATTACHED

Georgia Institute of Technology

A UNIT OF THE UNIVERSITY SYSTEM OF GEORGIA

COLLEGE OF SCIENCES AND LIBERAL STUDIES

ATLANTA, GEORGIA 30332


(404) 894-3300

WIS file
Continued
9 31-611

OFFICE OF THE DEAN

December 3, 1981

MEMORANDUM

TO: MS. JOAN CALLANAN, PROGRAM MANAGER, NATIONAL SCIENCE FOUNDATION
FROM: VIRGINIA S. WATTS, 1980 SCIENCE CAREER WORKSHOP PROJECT 
SUBJECT: ANNUAL PROGRESS REPORT

Phase I: Workshop

Since the last progress report we have completed the follow up evaluation for our workshop. A questionnaire was sent to each participant to determine

1. follow up activities undertaken by the participants
2. participants' perceptions of additional resources needed for career development
3. desirable workshop modifications
4. participants' perceptions (where applicable) relative to their own unemployment or underemployment.

The results from the questionnaires are enclosed. The respondents identified a number of improvements which they felt could be made in the workshop format, some feasible, some not. Forty-eight out of a total of 63 respondents indicated initiation of new career plans or action since the workshop. This particular response is highly encouraging since it reflects success in an important workshop goal, mobilizing women to take control of their careers through positive action.

Phase II: Continuing Activity

In addition to personal career discussions with individual students, I planned and directed a dinner forum for our women students on November 22, 1981. The forum focused on networking and career concerns. It included a panel presentation, discussion, interaction between students and resource women, and dinner.

The topics covered in the panel presentation were

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"The Masks Women Wear"
"The Transition from School to Work"
"Women and the Work Environment"
"Networking"

One hundred and twenty-six students registered. Twenty-four women from industry and seven from academia were recruited as resource persons. The students rated the forum 4.4 out of 5 in overall effectiveness and 4.6 out of 5 in enjoyment. A list of the resource women for this activity is attached as well as results from the evaluation instrument.

One of our counselors who participated in last year's workshop has developed a series of tapes using the faculty and directors of our schools to describe career opportunities in their areas. These tapes are maintained in the counseling center and are used by many students. Each tape is approximately 20 minutes long and follows a standard format. This project is an indirect spin off from the workshop.

/sa

Attachment

THE FOLLOWING IS A LIST OF RESPONSES TO QUESTION #9 ON THE QUESTIONNAIRE:

No, but the one comment for improvement I heard most frequently was that most of the "successful" employers who spoke were transplanted Yankees - indicates a need for more truly Southern prospective employers. Note: Most useful information was that on what questions could logically be expected from prospective employers.

More specific information with examples on resumes, cover letters, and interview techniques (other than the video tape that was shown). A job fair with companies "ready and looking for someone to hire."

I would like to see more included for the woman who has been out of the workforce for a number of years. I felt the workshop was geared to women just graduating or already working - with a ten year old degree and six years of staying home with my children, I am looking for help in deciding what options are open to me now.

I felt that in addition to the emphasis on the field of management, I would have liked more emphasis on science. For example, not only marketing a product, but doing pure and simple scientific research, or having a career in academia (say a professor at Georgia Tech).

The opportunity to chat with company representatives "launched" me on my career search. September was not too early to start ... too many folks I know have waited to the last minute.

Include in any future workshop high school senior and junior girls.

I thought the workshop was excellent and would encourage other women to attend future workshops. The only problem was the usual can-only-be-one-place-at-one-time of all workshops with many interesting sessions.

For a one day workshop I think everything there was time for was there, In a larger workshop I would like more discussion with different professionals and other participants, to understand other's experiences better. It's great there will be more workshops next year. I hope the quality of the speakers will remain as high. Best wishes!

It would have been nice to have had a newsletter developed with job opportunities in science fields for the workshop. Including more women in different levels of management in science fields available for insight and direct discussions would have been advantageous. More attention to the needs of women planning career changes to utilize science degrees where the women have been underemployed or employed outside their area of interest was needed.

No. I found the informal chats very helpful. Also, the visit to the career fair was informative.

Yes. Follow up of career information and counseling on an individual level.

Yes, I think you should include information about the "follow-up letter" and the "cover letter". At Emory we have a format to go by which has been particularly helpful.

Job opportunities at the Bachelor degree level in science; possible directions a science career could take.

I thought the workshop was very informative. However, since then I have decided to get out of the science field entirely. I thought the workshop was geared more for college graduates and could have more to offer women who have been out of college for some time and want to get into the job force for the first time or want to change jobs within the science field.

ANSWERS TO QUESTION #9 CONTINUED

No.

I think it would have been helpful if someone had addressed the question "Why Go to Graduate School in a Pure Science."

Perhaps a session on identifying marketable skills, and how to present yourself in an interview. Maybe supply participants with a list of local contacts to use in networking.

I feel there should have been more emphasis on biological fields. I have a B.S. degree in Biology and I found very little at the workshop which dealt with getting a job in this field.

More time to talk to employers that were on campus that day.

More for the younger professional just beginning her career.

I think more professionals in SPECIFIC fields of Engineering.

No.

Too many people graduate from school and get a job without knowing what that job is about. Advice was given to the effect that in job interviews you should know what position you're applying for. However, for a new grad that position is usually just a title grabbed from a company report. That grad has no idea of the job that that title applies to. I would like to see some advice given on how to decide what job to apply for, and how to tell what the job actually offers.

More of a separation of career counseling and coping skills for those of us dealing with male dominated work situations. A section in legal rights of employees and employers in regards to sexual discrimination.

Not that I can think of.

There might have been more information about grad schools other than law or medical school, and there might have been more information about academic careers. I want to teach physiology on a college level, so a lot of material was interesting to me only because it involved working women in general or industry work in general (my husband is in chemical engineering). I could not learn about women in my specific career.

No.

I think it would be entirely appropriate to have a workshop (or a section of a workshop) address the situation described below and even perhaps serve as a place for "creative thinking" as far as solutions to the problem may be concerned. This is not uniquely a woman's problem, but as the majority of "unfaculty" are female, such a discussion would be very useful to women.

I feel that the workshop covered the areas that are of most interest to me thoroughly. Although I feel that more women in industrial areas. (this was incomplete on the form - sa)

Case studies on how to handle male chauvinism might be constructive.

Co-ed workshop. I felt that the women most visible were frustrated, bitter and not willing to fit into a working situation with ease. I came away feeling quite negative and that men were "out to get me", a feeling which I had never fostered on my own. I would not be in favor of supporting another NSF workshop of this kind. Cost/benefit does not warrant further sessions. (However, the food was quite nice.)

ANSWERS TO #9 CONTINUED

Younger women with successful careers. I felt that by the time that I reach 40, I may move up the ladder also. I feel more discussion is needed on how to get a job without experience or how do you get experience?

No.

No.

ANSWERS TO QUESTION #10 ON THE QUESTIONNAIRE FOLLOW:

Women in Nursing are making progress very slowly. Further education and an assertive manner are the answer at this time. We are still not financially compensated for the amount of responsibility we have. I am seriously considering transferring my skills into the business aspect of medicine.

My problem is that I have a B.S. in Chemistry. My male friends have no problem finding employment in industry without experience. We all have virtually the same background. I have been told by companies if I could get a job, I would have to make \$3,000 - \$5,000 less in a year. Solution: ERA.

One of my setbacks was not being employed while married. The other is employers want people already trained. Most employers do not want to take the time to train for the particular job.

Since I have young children I wish to spend some time with, I wish I could find work in my area (chemistry) on a part-time basis.

I am a student.

I am a Ph.D. biochemist. I am currently working full time in a grant funded research position. I like my situation very much. I am able to be creative scientifically. I spend some time interacting with students. I do not really want a "normal" academic position. I do not particularly enjoy teaching - and I do not think teaching does anything to enhance one's career in research. The problem for a person of my status is the uncertainty of funding. Even though we (Ph.D. level non-faculty researchers) are the backbone of virtually all academic research, the system as a whole barely acknowledges our existence. I look forward to a time when this may change. The problem has already been recognized at the national level - see enclosed reference - it only remains to see what the "system" shall do to resolve it.

I believe I am underemployed; I realize you need to start at the bottom, but staying there is another matter. I have a B.S. degree in Applied Psychology from Georgia Tech. I am presently employed with U.S. Department of Health and Human Services, Office of Investigations as an Investigative Assistant (GS-6). Supposedly my job is to assist the special Agents during their interviews of witnesses/subjects, assist in case development, etc. However, since there is presently a freeze on Federal hiring, we have a clerical problem in our office and my duties for two years have been strictly clerical. The supervisor makes a lot of promises that I'll be helping with cases, yet I have only assisted with one case so far. In other words I have a title, but I am not performing the job description (except for other duties as assigned).

An education that was too technically oriented left me with a lack of understanding of the role of the "person" in the job market.

ANSWERS TO #10 CONTINUED

I'm a student, so I'm not subject to unemployment or underemployment. I haven't had any problems with summer jobs in my field. As far as academic discrimination, I go to a women's college, so the discrimination is all in my favor. Spending the past three years in a place where female is the norm has been wonderful. Every woman should have that experience. It has to be experienced to be appreciated.

Because I don't have an Engineering degree, but equivalent training and experience - a B.S. in finance and economics with a minor in computer science - my title was changed to analyst. I fought that - which I would not have (possibly) without the "silent" support of women such as I met at the conference. My title and the other female engineer was changed. However, the one male engineer's (who doesn't have an engineering degree) title was not. We fought, but to date have not succeeded. We are not treated as professionals, but more like secretaries. My supervisor practically clocks the two of us in and out which is not the case for the other engineers. He and the men exchange job opportunities and information which is not passed along to us. We are not part of their network, are not seen as career oriented and not treated equally.

I'm still in school, but will be graduating soon. I've looked at advertisements in the papers and most companies state that they want someone with at least 2-3 years experience or something like that. That could be a problem - where are we supposed to gain experience if they don't give us a chance?

So far, in my career, I think I have been the main barrier. My lack of self-confidence has limited my career. I have not been able to envision myself in higher positions until very recently. The workshop did contribute to building my confidence.

I have a master's degree in microbiology, and I work as a laboratory technician in a R & D chemical lab. Jobs in micro seem to be scarce and low paying. I can make as much or more as a lab technician in a field in which I'm not trained for. My lack of contacts and lack of knowledge of available alternatives could be barriers to my career progress.

I currently am in the co-op program at Tech, so I am not really personally affected by this problem. However, I have noticed that my company has much fewer women than one would expect from looking at statistics regarding women with scientific training. They tell me at work that this is because it is still a new phenomenon, and it will take a while for enough women to move up to equalize things. What I think this means is it will take a while for the older management who still stereotype women to be replaced by people who went to school with women and who can recognize their abilities.

Currently an undergraduate student.

Not applicable.

Being a woman in a male dominated work world where they are told by law they must not discriminate, but find stupid reasons to hire the equally or less equally qualified male over the qualified female. I find this more of a problem in Georgia than Ohio. Being a recent transplant from Ohio, many employers seem reluctant to check references since it's long distance or inconvenient to write a letter. It's easier to just put my application aside when there are always so many to choose from. The lack of knowledge people have about how similar a physics degree is to an engineering degree in many respects and insist that engineers are the only ones that ever worked hard in college. Due to consistent underemployment, my career has not gotten off the ground yet (5 years since college graduation) so my experience background is weak. My resume looks like I'm a job hopper when it's merely due to always being underemployed and striving to find something satisfying. I can't even get underemployed in this state and I am working as an Olsten temporary.

I am working as a substitute teacher because I have been unable to find a job in a laboratory (even a chemistry lab). There are two main problems I have come up against: (1) people who have a master's degree, who have done graduate work or have a lot of experience apply for the same jobs I do (requiring only a B.S. degree, some with no experience needed). (2) I have been unable to get work experience in a laboratory and some jobs require experience.

At the present time I am still in college, but I will be graduating in a year. I am concerned at this point in gaining some work experience, possibly through internships, in my field. I feel that experience is much more important than specific classes that were taken.

I have not yet graduated from college (June 7). Graduation will, hopefully, remedy some of my employment problems.

I have met my goal of professional biologist, however I feel that women (as well as many men) are grossly underpaid for their technical abilities. I feel that in the field of biology there is a surplus of trained people and this contributes to the low salaries commonly found.

As a "full-time" wife and mother, I am barely able to work part-time in my field of teaching math. I feel that it will be 7 or 8 years before I can seriously consider full-time work. Until then, I am very much on the periphery of "Women in Science Careers." Carol Siegmann

I can only speak for myself. I had an extensive science background and taught science for 10 years. After teaching, I really didn't know what options were available to me, if any, for someone with my background and age, to pursue in the field of science other than teaching. Therefore, I totally abandoned science and started in a career totally different.

I am involved with the career counseling of individuals rather than seeking a career for myself in science related or technical areas.

The workshop was invaluable to me because it emphasized the fact that without a higher degree in the sciences there were (1) no worthwhile jobs around and (2) salaries were so low that a higher degree wasn't worth the effort without 100% dedication. I am 42 years old with a bachelors degree and don't have time for dedication. I need a job, a career and money now and will seek it in business where there are more options available to me. No other choice!

As a result of the workshop I have recently pursued an actuarial career. I have been hired in a trainee position and hope to begin taking the actuarial exams this fall.

After receiving a B.S. degree in Mathematics in 1970 I was unable to find a job in which I could truly use my degree. I remember one potential employer (IBM) asking me if I planned to have children and would my husband mind if I traveled. I was finally hired by an insurance company. I was underemployed as well as underpaid. I could have gotten the same job without a college degree. As soon as I was financially able, I quit. I relocated to Atlanta got a job as a statistician only to learn my employer had wanted a clerical! Since I was being paid less than the starting salary for a police officer and I could get college incentive pay as an officer, I became one. Eight years later, I'm trying to make a positive career change.

I feel that I am unemployed because of the lack of entry level positions in chemistry fields. Another point, perhaps even stronger is the lack of contacts in my field. At Agnes Scott College there is a very small recruiting schedule and I feel that the lack of personal interviews has seriously hindered my employment state.

ANSWERS TO #10 CONTINUED

I am definitely underemployed for my knowledge of chemical lab techniques and computer programming. However, I think this is due to not having a degree rather than being female. This is also a bad location for chemists. (I am working as a secretary.)

I'm just finishing my degree, have a summer job as an apprentice industrial hygienist and am looking for a permanent job.

I am a full time student.

N/A

Presently I'm job hunting and unemployed. My first barrier is self. I'm scared to death, I feel under prepared, and I have to have superior credentials. The second barrier is that I cannot find any guidelines for salaries in my field. The third is that I feel like I have more to offer a company than my work experience would indicate. So having trouble indicating an exact position.

I am not a woman. However, I have been in a position to help several women (who I felt were deserving) in gaining the experience and self-confidence they lacked, in at least partly becoming winners in their chosen fields. Several keys to success in getting ahead after graduation are (a) getting part-time employment summers while still in school in the field of their choice. Federal or state government is a good training ground (b) request past employers to write recommendation(s) (c) seek employment while carrying past job recommendations with prospective employee. These people have a 10 to 1 advantage over those who loaf summers.

RESOURCE WOMEN FOR "EXPANDING HORIZONS" FORUM

Betty Bearden - 449-5582
President
Papillon, Inc.
2930 Amwiler Court
Atlanta, Georgia 30360

Lorrie Boots
Development Operations Manager
I.B.M.
Department 636, Building 001
P.O. Box 12195
Research Triangle Park, North Carolina 27709

Jan Botz - 992-8378
Sales Representative
Dow Corning
5775 Peachtree Dunwoody Rd, Suite 450-E
Atlanta, Georgia 30342

Laurie Carlton - 447-3839
Development Engineer
Western Electric
Department 82-30
2000 Northeast Expressway
Norcross, Georgia 30071

Kay Cornelius - 424-4770/424-3332
Senior Aircraft Structures Engineer
Lockheed Georgia Company
86 South Cobb Drive
Marietta, Georgia 30063

Amie Hardman Cotter - 391-2183
Engineer
Southern Bell
100 Perimeter Center Place, Room 397
Atlanta, Georgia 30346

Susan Park Esche - 1-746-5311
Dye Chemist
Burlington Industries
HOME:
P.O. Box 13
Rabun Gap, Georgia 30568

Joanne Eustace, M.D. - 894-2584
Georgia Tech Clinic
Georgia Institute of Technology
Atlanta, Georgia 30332

Kathy Harrer - 925-5914
Electrical Engineer
Scientific Atlanta
4386 Park Drive
Norcross, Georgia 30093

Julia Howell - 898-2121
Manager Regulatory Submissions
The Coca-Cola Company
310 North Avenue
Room TEC 306B
Atlanta, Georgia 30301

Linda Hsieh - 393-4700
Loss Prevention Consultant
Factory Mutual Engineering
12 Perimeter Center
Atlanta, Georgia

Suzanne Imes - 524-3404
Psychologist
484 Moreland Avenue, NE, Suite 100
Atlanta, Georgia 30307

Ramona Jones - 391-3430
Associate Manager
Southern Bell
100 Perimeter Center Place, Room 330
Atlanta, Georgia 30346

Marsha King - 577-6450
Attorney
King and King Law Offices
15 Peachtree Street, Suite 808
Atlanta, Georgia 30303

Marilyn Massingill - 241-8173/352-1656
Environmental Engineer
City of Atlanta
1510 Key Road, SE
Atlanta, Georgia 30316

Joyce Myers - 424-5026
Aerospace Engineer
Lockheed-Georgia Company
86 South Cobb Drive
Dept. 7291, Zone 415
Marietta, Georgia 30063

Teresa Newberry - 391-2260
Building Industry Consultant
Southern Bell
100 Perimeter Center Place, Room 228
Atlanta, Georgia 30346

Patricia Powell - 898-3063
Chemist
The Coca-Cola Company
P.O. Drawer 1734, TEC 7
Atlanta, Georgia 30301

Nancy Redgate - 881-2328
Chemical Engineer
Environmental Protection Agency
HOME:
6983 J Roswell Road
Atlanta, Georgia 30328

Leagh Sledge - 939-9921
Industrial Engineer
Southern Bell
HOME:
4404 Hugh Howell Road
Tucker, Georgia 30084

Carolyn Smithson - 898-3632
Assistant Treasurer
The Coca-Cola Company
P.O. Drawer 1734
Atlanta, Georgia 30301

Phyliss Stallings - 424-9000
Distribution Engineer
Atlanta Gas Light Company
85 Church Street
Marietta, Georgia 30060

Jane Swit - 526-6526
Econ Analyst II
Georgia Power Company
Box 4545
Atlanta, Georgia 30302

Veronica Glas Wright
President
V. G. Wright & Associates
1100 Spring Street, Suite 320
Atlanta, Georgia 30309

PLANNING COMMITTEE
FOR THE "EXPANDING HORIZONS" FORUM

E. Jo Baker - 894-5053
Associate Vice President
Academic Affairs
Georgia Institute of Technology
Atlanta, Georgia 30332

Carolyn Cannon - 894-3354
Director of Special Programs
Dean's Office
College of Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332

Helen Grenga - 894-3090
Associate Dean
Graduate Studies
Georgia Institute of Technology
Atlanta, Georgia 30332

Marilu McCarty - 894-2600
Assistant Dean
College of Management
Georgia Institute of Technology
Atlanta, Georgia 30332

Amy Milburn - 894-3300
Student Assistant
College of Sciences & Liberal Studies
Georgia Institute of Technology
Atlanta, Georgia 30332

Carole Moore - 894-2564
Dean of Women Students
Dean of Students Office
Georgia Institute of Technology
Atlanta, Georgia 30332

Catherine Ross - 894-3844
Associate Professor
College of Architecture
Georgia Institute of Technology
Atlanta, Georgia 30332

Virginia S. Watts - 894-3302
Assistant Dean - Project Director
College of Sciences & Liberal Studies
Georgia Institute of Technology
Atlanta, Georgia 30332

"EXPANDING HORIZONS"

FORUM

11/22/81

Participant Comments:

The program last night was just super! It is obvious we have been needing something like that: the response was enthusiastic and the resource people seemed very interested in the concept.

It's nice to see so many young and attractive successful women.

I think this is an excellent program for women who are graduating soon. The forum has made women available for questions that need to be asked before our interviews are made.

It is a very good idea to bring professional women together to share their observations about women in the business world; potential graduates can learn a lot from this.

I really appreciated the honesty of the panelists and the resource women at our table. I learned quite a bit and would attend future similar functions.

I thought this was an excellent idea and enjoyed meeting the professional women who have made it and/or are on their way!

Really great, save the timing - the beginning of the quarter better than toward the end.

These forums are very enjoyable and informative. They need to be continued so all women on campus can realize their capacity. Before now, I had not realized how I responded (non-verbally) affected me and my future-success plans.

Keep up the good work! I particularly enjoyed the panel. There are numerous other topics which could be addressed in future panels.

This forum was very informative, educational, and enjoyable.

Very good and informative! Keep having these available for the women on campus.

Good choice of panelists and participants! Maybe even more concrete "how to's" are helpful.

Great idea! A very good way to talk to businesswomen and what they do.

The dinner and choice of speakers were both excellent!

I have thought and read about many of the issues addressed this evening, and it's exciting to hear successful women articulate some of my own thoughts, as well as to meet Tech women with common concerns. This kind of discussion is valuable and important anywhere, but especially at Tech, where we have very few female role models.

Comments Continued:

Very good selection of speakers!

This is most definitely a program that should be continued. Unfortunately, I would not have realized that until I got here, which is why I encourage you to find funding for the program rather than charge students - it will inevitably discourage many.

The smaller the ratio of women to students the better.

Very impressed!

Are there to be more forums? Can we call on the resource persons if we have employment related questions?

I think it was one of the best things that has happened lately. I think something like this (even if we had to pay) every quarter would be extremely helpful to Tech women.

Very nice to be awarded this opportunity to meet and talk to professional women.

Very good idea!

I enjoyed this opportunity immensely.

"EXPANDING HORIZONS"
FORUM
11/22/81

Participant Suggestions:

Longer chance for discussion with representatives.

Warmer dining room!

Bigger auditorium.

The night-time. It could have been earlier in the day so not rushed at the end. The room was cold!

The possible scheduling of similar activities at least once a year, perhaps every quarter.

I think the pressures on students would have been less great had the forum been held earlier in the quarter (i.e. less close to finals). A raised platform for the panel would have been appreciated. Other than those very minor suggestions, the forum was quite enjoyable.

Try having the presentation and dinner at the same time. Regulate the heat in the Student Center Ballroom. It would help if someone could emphasize to panelist a time limit and try enforcing that.

Perhaps the forum could have even more speakers. Their viewpoints and personal experiences were most enlightening and I feel VALUABLE. A more efficient method of integrating the non-speaker resource persons needs to be developed. Their opinions and general viewpoints need to be presented to help initiate interaction. I would enjoy a longer session, an afternoon perhaps noon to 6:00. Have all of the resource people make some sort of presentation/speech/talk.

More people in MANAGEMENT! I would like to meet people in accounting and finance! What about Toby Director!

More speakers, less time for each to talk. It was interesting and informative.

The forum could have more controversial topics. "The Masks Women Wear" was a very good topic. I would like to see and hear a discussion, from more than one source on discrimination of both males and females in the working world. I would also like to see a discussion on just how important is clothing in the office.

Starting earlier would give time for an informal session later.

Allow more time for questions. More information about the researcher's educational backgrounds to see where they have gotten with the degree they obtained (for example, some people's degrees have almost nothing to do with the actual work content of their careers).

Suggestions Continued:

Overall, it was quite enjoyable and informative.

A suggestion might be to have it begin in the afternoon and have more group discussion in groups of about 15 with at least 3 professional women. This way, there would be plenty of time for discussion after the panel discussion. Make sure, as was done, that it is understood that the purpose is to network with men, as well as with women.

It was a very interesting forum. Although, perhaps a bit too long. Perhaps have forums more often and less ambitious. One or two speakers with questions and answers. Or simply dinner and networking at the tables.

If possible, it would be very beneficial to meet more of the professional women - perhaps rotation of the people who wish to speak with additional women. I felt that I would like to speak with many of the participants; and, I was unable to do so.

THE IMPOSTOR PHENOMENON IN HIGH ACHIEVING WOMEN: DYNAMICS AND THERAPEUTIC INTERVENTION

PAULINE ROSE CLANCE SUZANNE AMENT IMES

*Georgia State University
University Plaza
Atlanta, Georgia 30303*

ABSTRACT: *The term impostor phenomenon is used to designate an internal experience of intellectual phoniness which appears to be particularly prevalent and intense among a select sample of high achieving women. Certain early family dynamics and later introjection of societal sex-role stereotyping appear to contribute significantly to the development of the impostor phenomenon. Despite outstanding academic and professional accomplishments, women who experience the impostor phenomenon persist in believing that they are really not bright and have fooled anyone who thinks otherwise. Numerous achievements, which one might expect to provide ample objective evidence of superior intellectual functioning, do not appear to affect the impostor belief. Four factors which contribute to the maintenance of impostor feelings over time are explored. Therapeutic approaches found to be effective in helping women change the impostor self-concept are described.*

In the past five years we have worked in individual psychotherapy, theme-centered interactional groups, and college classes with over 150 highly successful women—women who have earned Ph.D.'s in various specialties, who are respected professionals in their fields, or who are students recognized for their academic excellence. However, despite their earned degrees, scholastic honors, high achievement on standardized tests, praise and professional recognition from colleagues and respected authorities, these women do not experience an internal sense of success. They consider themselves to be "impostors." Women who experience the impostor phenomenon maintain a strong belief that they are not intelligent; in fact, they are convinced that they have fooled anyone who thinks otherwise. For example, students often fantasize that

they were mistakenly admitted to graduate school because of an error by the admissions committee. Numerous women graduate students state that their high examination scores are due to luck, to misgrading, or to the faulty judgment of professors. Women professionals in our sample feel overevaluated by colleagues and administrators. One woman professor said, "I'm not good enough to be on the faculty here. Some mistake was made in the selection process." Another, the chairperson of her department, said, "Obviously I'm in this position because my abilities have been overestimated." Another woman with two master's degrees, a Ph.D., and numerous publications to her credit considered herself unqualified to teach remedial college classes in her field. In other words, these women find innumerable means of negating any external evidence that contradicts their belief that they are, in reality, unintelligent.¹

Self-declared impostors fear that eventually some significant person will discover that they are indeed intellectual impostors. One woman stated, "I was convinced that I would be discovered as a phony when I took my comprehensive doctoral examination. I thought the final test had come. In one way, I was some-

¹ The question has been raised as to whether or not men experience this phenomenon. In our clinical experience, we have found that the phenomenon occurs with much less frequency in men and that when it does occur, it is with much less intensity. We have received mixed opinions from male colleagues with whom we have consulted. The attribution research findings, summarized later, imply that the impostor phenomenon would be found less frequently in men than in women. We have noticed the phenomenon in men who appear to be more in touch with their "feminine" qualities. This clinical observation needs to be researched.

what relieved at this prospect because the pretense would finally be over. I was shocked when my chairman told me that my answers were excellent and that my paper was one of the best he had seen in his entire career."

Women who exhibit the impostor phenomenon do not fall into any one diagnostic category. The clinical symptoms most frequently reported are generalized anxiety, lack of self-confidence, depression, and frustration related to inability to meet self-imposed standards of achievement.

Included in our sample have been 95 undergraduate women and 10 Ph.D. faculty women at a small academically acclaimed private mid-western co-educational college; 15 undergraduates, 20 graduate students, and 10 faculty members at a large southern urban university; six medical students from northern and southern universities; and 22 professional women in such fields as law, anthropology, nursing, counseling, religious education, social work, occupational therapy, and teaching. They were primarily white middle- to upper-class women between the ages of 20 and 45. Approximately one-third were therapy clients with specific presenting problems (other than the impostor problem); the other two-thirds were in growth-oriented interaction groups or classes taught by the authors.

While our focus has been on understanding the more personal, experiential effects of the impostor feelings, we find confirmation of our observations in the experimental findings of attribution theorists, who in recent years have begun to study differential attribution of success by men and women. In her review of the research on sex differences in the attribution process, Deaux (1976) points to considerable evidence that women consistently have lower expectancies than men of their ability to perform successfully on a wide variety of tasks. The findings of the research cited by Deaux are consistent with the following principles: 1) An unexpected performance outcome will be attributed to a temporary cause. 2) An expected performance outcome will be attributed to a stable cause. In line with their lower expectancies, women tend to attribute their successes to temporary causes, such as luck or effort, in contrast to men who are much more likely to attribute their successes to the internal, stable factor of ability. Conversely, women tend to explain failure with lack of ability, whereas

men more often attribute failure to luck or task difficulty. Given the lower expectancies women have for their own (and other women's) performances, they have apparently internalized into a self-stereotype the societal sex-role stereotype that they are not considered competent (see Broverman, *et al.*, 1972; Rosenkrantz, *et al.*, 1968). Since success for women is contraindicated by societal expectations and their own internalized self-evaluations, it is not surprising that women in our sample need to find explanations for their accomplishments other than their own intelligence—such as fooling other people.

Thus, unlike men, who tend to own success as attributable to a quality inherent in themselves, women are more likely either to project the cause of success outward to an external cause (luck) or to a temporary internal quality (effort) that they do not equate with inherent ability. Deaux suggests that "If . . . an unexpected event is attributed to some temporary factor, then future expectancies may remain unchanged, producing a self-perpetuating cycle." She further proposes, however, that repeated success experiences over a period of time should begin to change one's expectancies. We have been amazed at the self-perpetuating nature of the impostor phenomenon—with the pervasiveness and longevity of the impostor feelings of our high achieving women, with their continual discounting of their own abilities and persistent fears of failure. We have *not* found repeated successes alone sufficient to break the cycle. Additional factors which appear to strengthen the maintenance of the impostor phenomenon are discussed in the following section.

ORIGIN, DYNAMICS, AND MAINTENANCE

Why do so many bright women, despite consistent and impressive evidence to the contrary, continue to see themselves as impostors who pretend to be bright but who really are not? What are the origins and dynamics of such a belief and what functions could be served by holding on to such a belief?

We have observed that our "impostors" typically fall into one of two groups with respect to early family history. In one group are women who have a sibling or close relative who has been designated as the "intelligent"

member of the family. Each of the women, on the other hand, has been told directly or indirectly that she is the "sensitive" or socially adept one in the family. The implication from immediate and/or extended family members is that she can never prove that she is as bright as her sibling regardless of what she actually accomplishes intellectually. One part of her believes the family myth; another part wants to disprove it. School gives her an opportunity to try to prove to her family and herself that she is bright. She succeeds in obtaining outstanding grades, academic honors, and acclaim from teachers. She feels good about her performance and hopes her family will acknowledge that she is more than just sensitive or charming.

However, the family seems unimpressed, still attributing greater intelligence to the "bright" sibling whose academic performance is often poorer by comparison. On the one hand, the woman who feels she is an impostor continues to be driven to find ways of getting validation for her intellectual competence; on the other hand, she thinks her family may be correct, secretly doubts her intellect, and begins to wonder if she has gained her high marks through sensitivity to teachers' expectations, social skills, and feminine charms. Thus, the impostor phenomenon emerges.

A different family dynamic operates for the second group of women experiencing the impostor phenomenon. The family conveys to the girl that she is superior in every way—intellect, personality, appearance, talents. There is nothing that she cannot do if she wants to, and she can do it with ease. She is told numerous examples of how she demonstrated her precocity as an infant and toddler, such as learning to talk and read very early or reciting nursery rhymes. In the family members' eyes she is perfect.

The child, however, begins to have experiences in which she cannot do any and everything she wants to. She *does* have difficulty in achieving certain things. Yet she feels obligated to fulfill the expectations of her family, even though she knows she cannot keep up the act forever. Because she is so indiscriminately praised for everything, she begins to distrust her parents' perceptions of her. Moreover, she begins to doubt herself.

When she goes to school her doubts about her abilities are intensified. Although she does out-

standing work, she does have to study to do well. Having internalized her parents' definition of brightness as "perfection with ease," and realizing that she cannot live up to this standard, she jumps to the conclusion that she must be dumb. She is not a genius; therefore, she must be an intellectual impostor.

One of our clients who had trouble with spelling remembers that she pretended to be "sick" for three consecutive Fridays when spelling bees were held. She could not bear the thought of her parents finding out she could not win the spelling contest. Another client recalled that when she was studying she would pretend to be playing with her art material whenever her mother walked in the room. Her mother had made it very clear to her that smart people do not have to study. By using such cover-up strategies our clients believe they have managed to fool their parents, but internally they are painfully convinced they are phonies.

As we have indicated, our observations have led us to believe that the impostor phenomenon begins to develop originally in both groups of girls in relation to the family. It has been suggested to us that the real root of the problem lies in social expectations mentioned earlier. This is a chicken or egg problem that definitely needs to be researched. However, our current hypothesis is that the high achieving women in our sample escaped, at least to some degree, the societal sex-role stereotyping in the preschool years that can be transmitted through the parents. Even the women in our sample who were not considered the brighter child were expected by their parents to do well in school. The fact that these women continue to succeed in spite of antithetical societal expectations implies strong early instillation of achievement motivation. We do believe that the societal stereotype of women being less able intellectually than men begins to exacerbate and confirm at an early age the self-doubts that have already begun to develop in the context of the family dynamics. One study (Nicholls, 1975) indicates that differential attribution of success and failure by girls and boys is already operative by the age of ten. The girls in the "sensitive" group appear to develop their original self-doubts about their intellect from the differential between their perception that they are not considered bright and their actual high achievements. The girls in the "bright" group first develop self-doubts

from the small differential between what they are expected to achieve and what they can achieve. Feelings of phoniness for both groups are further affirmed by the differential between high achievement and low societal expectations. The women's own self-image of being a phony is consonant with the societal view that women are not defined as being competent. If a woman does well, it cannot be because of her ability but must be because of some fluke. If she were to acknowledge her intelligence, she would have to go against the views perpetuated by a whole society—an ominous venture indeed! And yet the women we have encountered, by their very perseverance in continuing to succeed against tremendous odds, appear to want also to prove themselves and society wrong. At the same time there are intense and deepseated beliefs in the impostor position, there are also strong (though frequently unsuccessful) attempts to overcome it.

Why is the impostor phenomenon so difficult to overcome? We have observed at least four different types of behaviors which tend to maintain the impostor phenomenon once the posture of being an intellectual phony has been assumed. A woman may participate in one or more of these behaviors, but seldom all of them.

The first type of behavior involves diligence and hard work. The fear that "my stupidity will be discovered" is constantly present; consequently the woman studies or works very hard to prevent the discovery. Hard work and study pay off in excellent performance and approval from authorities. The cycle, worry about intelligence—hard work and cover-up strategies—good grades or performance—approval and temporary good feelings, is reinforcing. The woman feels elated temporarily and such feelings of success make the cycle very hard to give up. She develops an unstated but vaguely aware belief that if she were to think she could succeed she would actually fail. Her belief takes on the quality of a magical ritual which will guarantee at least an overt success. However, the success is an empty one, and the good feelings are short-lived because the underlying sense of phoniness remains untouched.

A second mode of behavior centers around a sense of phoniness which is based in part in reality. Many of our clients engage in intellectual inauthenticity in one way or another. They

have chosen at times not to reveal their real ideas or opinions. Instead they have accurately "psyched out" their professors, supervisors, and colleagues and given them what they most wanted to hear. They have participated in "intellectual flattery." For example, a student might note a professor's biases and be sure to cite numerous studies which would support those biases on an exam question or in a paper, even though she might personally hold different views. In writing a grant proposal for an educational program one client included her supervisor's ideas and downplayed her own. A more subtle example is the woman who remains silent in the face of an opposing viewpoint. Consequently she is left with the impression, "If I had revealed what I really think and believe, I might not have done well. I might have been considered unintelligent." This type of avoidance prevents our clients from discovering whether or not their authentic views would have been evaluated as sensible, and it thus contributes to the maintenance of the impostor phenomenon.

Another kind of behavior has to do with using charm and perceptiveness to win the approval of superiors. For a woman who uses charm in this way, the aim is to be liked as well as to be recognized as intellectually special. Typically, she believes, "I am stupid," but at another level she believes she is brilliant, creative, and special if only the right person would discover it. She is looking for a mentor to discover her genius and thereby help her believe in her intellect. She first finds a candidate she respects and then proceeds to impress that person. She studies the person carefully and perceives very accurately what that person will be responsive to. She uses her friendliness, charm, looks, humor, sexuality, and perceptiveness to win the person over. For example, if the potential mentor grows mushrooms, the woman will make it her business to be able to converse enthusiastically and knowledgeably about mushroom growing. If the candidate is in a difficult situation, the woman listens with understanding and concern. She may volunteer to assist a professor with his/her pet research project. She may even become sexually involved with the mentor. This process of seeking (and usually gaining) approval from an admired authority figure is unsuccessful in changing the impostor system for two reasons. First, even when the mentor does acclaim her as intellectually superior, crea-

tive, and special, she does not believe him/her because she believes the mentor has based his/her opinion primarily on her other attributes. The current candidate is discounted as unable to judge her accurately. She begins a search for another mentor and will repeat the same self-defeating process. Second, the woman continues to believe that if she were really bright she would not need outside approval. She should have internally-based confidence in her own ability. Thus, efforts to gain approval give proof that she is intellectually phony. After all, people who are geniuses or innovators in their fields manage to be productive and creative despite lack of support from others; they certainly would not resort to adaptive or placating behaviors to gain validation. To engage in such phoniness is to lack integrity in the eyes of our clients.

The phenomenon may be further maintained in response to the negative consequences that are likely to befall the woman in our society who displays confidence in her ability. Margaret Mead (1949) has noted that the successful or independent woman "is viewed as a hostile and destructive force within society." According to Mead, a woman's femininity is called into question by her success. Matina Horner's (1972) studies support Mead's observations that for a woman to succeed in our culture is indeed a fearsome venture. Horner indicates that many women have a motive to avoid success out of a fear that they will be rejected or considered less feminine if they do succeed. Maccoby (1963) has asserted that "the girl who maintains qualities of independence and active striving (achievement-orientation) necessary for intellectual mastery defies the convention of sex-appropriate behavior and must pay a price, a *price in anxiety*." To maintain a sense of herself as being an intellectual phony may allow a high achieving woman to live out her achievement orientation to a large degree and at the same time allay some of her fears about the negative consequences of being a successful woman in our society. As long as she maintains the notion that she is not bright, she imagines that she can avoid societal rejection.

THERAPY

Evidence of the impostor phenomenon has typically emerged after an individual has been in a group or individual psychotherapy for

several sessions. It is rarely stated as the presenting problem since it is a well-guarded secret which is not shared immediately. The "impostor" is so convinced her belief is correct that nothing could be done to change it anyway. She also believes that if she revealed her assumed unique feelings of phoniness she would meet with criticism or at least very little understanding on the part of others. It is generally her anxiety about achieving a particular goal which leads her to disclose feelings of intellectual phoniness.

A multimodal therapy in which several therapeutic approaches are used concurrently seems most effective in altering the impostor belief in a client. A group therapy setting or an interactional group in which there are some other high achieving women experiencing the impostor phenomenon is highly recommended. If one woman is willing to share her secret, others are able to share theirs. They are astonished and relieved to find they are not alone.

A group setting is also valuable because one woman can see the dynamics in another woman and recognize the lack of reality involved. Mary cannot believe that Jane thinks she is stupid. After all, Jane has a Ph.D. from an outstanding university, is a respected professor, and is obviously bright. In a group setting, the ways in which an individual negates positive feedback and maintains her belief system emerge in clear relief and can be brought to the attention of the client.

The client needs to become aware of the superstitious, magical aspects of her impostor belief and must consciously experiment with changing her ritualistic behaviors. For example, she is encouraged to study for an exam with the expectation, "I will do well on this exam" rather than, "I may fail." When she is able to succeed without the self-doubting beforehand, she has made a major breakthrough in undoing her ritual of predicting failure. Weekly homework assignments to practice new ideas about the self as well as to decrease compulsive work habits (which perpetuate "effort" attributions) can also be very useful. However, we have found that such assignments must be suggested in small, incremental steps. Since the old phoniness feelings and hard-work habits are so powerfully associated with at least overt success, trying to give them up too quickly, before other attitudes and habits have been

experienced as personally more satisfying, can result in acute anxiety and/or reversion to the relative security of old ways.

One effective Gestalt experiment is to have the client recall all the people she thinks she has fooled, to tell them in fantasy how she conned or tricked them, and to have her imagine out loud how each person would respond to her. They may inform her, "I did not give you an award in English because you charmed me. I did like you as a person but I honored you for your outstanding work," or "I'm angry that you think I'm so stupid that I can't judge competence when I see it," or "I don't like your negating me and my opinions."

A helpful homework assignment is to have the client keep a record of positive feedback she receives about her competence and how she keeps herself from accepting this feedback. After she becomes aware of how she denies compliments, she is instructed to experiment with doing the opposite—to listen, to take in the positive response, and to get as much nourishment as possible out of it.

Another productive Gestalt technique is to have the client role-play the opposite of "I'm not bright," *i.e.*, to have her act out being bright, feeling it and expressing it in the presence of the group or therapist. Reactions to this role play are varied. Frequently a woman gets in touch with and is able to reveal a heretofore hidden fantasy that she is special and outstanding—a facet of the self-image which lurks beneath the overriding feeling of self-doubt. She can then work through the fears and guilt which accompany the fantasy of specialness and can move toward a realistic and self-affirming view of her own abilities, neither overestimating nor underestimating them. This role play helps some women confront their fears of success. This usually happens when a client is particularly resistive to the exercise, having difficulty acting out such an "arrogant" position. Through confronting her resistances to the exercise, the client confronts her catastrophic fantasies about the consequences of being successful. She may discover she is frightened that others would consider her exhibitionistic, snobbish, or unfeminine. Such fears are often accompanied by memories of concrete experiences, such as being kidded by other children when teachers singled her out for outstanding work or being shunned by boys who felt intel-

lectually inferior. In taking the stance of being bright and capable, many women experience a rewarding sense of their personal power. If, as is often the case, they receive applause from other group members for such self-affirmation, their fears about acknowledging their brightness begin to subside.

For a woman who has used charm and/or intellectual flattery to gain approval from authority figures, much time is spent on increasing awareness of those times when she is being phony—when she does or says something she does not want to in the hope of gaining approval. She is encouraged to risk "being herself" and seeing what happens. Usually the catastrophic expectations do not occur. Also, by eliminating approval-getting behaviors, the woman can begin to accept compliments from others regarding her intelligence as being "real" and can internalize the external reinforcement she does receive. In the course of therapy, these clients are also encouraged to seek out people who will support them in their struggle to be authentic and not to depend on those who would be threatened by their abilities and achievements.

As a result of a combination of such therapeutic interventions in conjunction with a commitment to change, a high achieving woman who has previously considered herself an impostor begins to allow herself to state and feel, "I am intelligent. I have learned and achieved a tremendous amount. It is all right for me to believe in my own intellectual abilities and strengths." She begins to be free of the burden of believing she is a phony and can more fully participate in the joys, zest, and power of her accomplishments.

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WOMEN IN SCIENCE

A Career Workshop Program

Sponsored by

The National Science Foundation

a n d

Georgia Institute of Technology

FINAL REPORT

June, 1982

Project Director

Dr. V. Sherrill Watts
Georgia Institute of Technology

PLEASE READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING

PART I-PROJECT IDENTIFICATION INFORMATION

1. Institution and Address Georgia Institute of Technology Atlanta, Georgia 30-32	2. NSF Program Women In Science 1980 4. Award Period From 6/15/80 To 1/31/82	3. NSF Award Number SPI-8008184 5. Cumulative Award Amount \$19,755.00
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6. Project Title

Science Career Workshop Project

PART II-SUMMARY OF COMPLETED PROJECT (FOR PUBLIC USE)

One-hundred-and-thirty-nine women, approximately half of whom have college degrees in Science or Mathematics fields, participated in a Science Career Workshop at Georgia Institute of Technology, September 30, 1980. They were given information and advice on career selection, job search, resume preparation, interview techniques, and career related problems, by successful women with backgrounds in science and by representatives from companies which provide employment in science, engineering, and mathematics. Several off-campus participants requested and received extended career counseling through Tech's counseling center. All participants were placed on a mailing list to receive periodic information related to careers.

After the Workshop, a women's science career advisor was appointed in the College of Science and Liberal Studies. She has made career presentations to groups of college students, high school students and teachers, as well as discussing careers with individual students. Then, in November, a dinner forum focused on networking and career concerns was held for women students at Georgia Tech. One-hundred-and-twenty-six students and twenty-four resource women participated.

On the follow-up questionnaire six months after the Workshop, forty-eight women indicated initiation of new career plans or action. Actions mentioned included investigating additional training and new jobs, taking courses, applying to graduate school, and requesting raises or promotions. The Workshop and follow-up activities obviously served as catalysts for career awareness and action by many of the women who participated.

PART III-TECHNICAL INFORMATION (FOR PROGRAM MANAGEMENT USES)

1. ITEM (Check appropriate blocks)	NONE	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
				Check (✓)	Approx. Date
a. Abstracts of Theses	X				
b. Publication Citations	X				
c. Data on Scientific Collaborators	X				
d. Information on Inventions	X				
e. Technical Description of Project and Results		X			
f. Other (specify)					
2. Principal Investigator/Project Director Name (Typed) V. Sherrill Watts	3. Principal Investigator/Project Director Signature V. Sherrill Watts			4. Date 7/1/82	

INSTRUCTIONS FOR FINAL PROJECT REPORT (NSF FORM 98A)

This report is due within 90 days after the expiration of the award. It should be submitted in two copies to:

National Science Foundation
Division of Grants and Contracts
Post-Award Projects Branch
1800 G Street, N.W.
Washington, D.C. 20550

INSTRUCTIONS FOR PART I

These identifying data items should be the same as on the award documents.

INSTRUCTIONS FOR PART II

The summary (about 200 words) must be self-contained and intelligible to a scientifically literate reader. Without restating the project title, it should begin with a topic sentence stating the project's major thesis. The summary should include, if pertinent to the project being described, the following items:

- The primary objectives and scope of the project.
- The techniques or approaches used only to the degree necessary for comprehension.
- The findings and implications stated as concisely and informatively as possible.

This summary will be published in an annual NSF report. Authors should also be aware that the summary may be used to answer inquiries by nonscientists as to the nature and significance of the research. Scientific jargon and abbreviations should be avoided.

INSTRUCTIONS FOR PART III

Items in Part III may, but need not, be submitted with this Final Project Report. Place a check mark in the appropriate block next to each item to indicate the status of your submission.

- a. Self-explanatory.
- b. For publications (published and planned) include title, journal or other reference, date, and authors. Provide two copies of any reprints as they become available.
- c. Scientific Collaborators: provide a list of co-investigators, research assistants and others associated with the project. Include title or status, e.g. associate professor, graduate student, etc.
- d. Briefly describe any inventions which resulted from the project and the status of pending patent applications, if any.
- e. Provide a technical summary of the activities and results. The information supplied in proposals for further support, updated as necessary, may be used to fulfill this requirement.
- f. Include any additional material, either specifically required in the award instrument (e.g. special technical reports or products such as films, books, studies) or which you consider would be useful to the Foundation.

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Project Director

V. Sherrill Watts
Assistant Dean
College of Sciences and Liberal Studies
Georgia Institute of Technology

Advisory Committee

E. Jo Baker
Professor of Psychology and
Associate Vice President for Academic Affairs

Toby F. Block
Assistant to the Director,
School of Chemistry

Barbara M. Darby
Counselor

Coleen A. Donahue
Assistant to the Dean,
College of Engineering

Michael A. Donahue
Director, Corporate Relations and Placement

William H. Eberhardt
Regents Professor of Chemistry

Helen E. Grenga
Professor of Chemical Engineering and
Associate Dean, Graduate Division

Edward H. Loveland
Professor and Director,
School of Psychology

Judith G. Morgan
Assistant Professor of Biology

Planning Committee Dinner Forum

E. Jo Baker
Professor of Psychology and
Associate Vice President for Academic Affairs

Carolyn Cannon
Director of Special Programs for the
Engineering College

Helen Grenga
Professor of Chemical Engineering and
Associate Dean, Graduate Division

Planning Committee Dinner Forum (cont'd.)

Marilu McCarty
Assistant Dean,
College of Management

Amy Milburn
Student

Carole Moore
Assistant Dean of Students

Catherine Ross
Associate Professor of Architecture

Sherrill Watts
Assistant Dean,
College of Science and Liberal Studies

ABSTRACT

One-hundred-and-thirty-nine women, slightly over half with college degrees, participated in Georgia Tech's Science Career Workshop September 30, 1980. They were given information and advice on career selection, job search, resume preparation, interview techniques, and career related problems by successful women with backgrounds in science and by representatives from companies which provide employment in science, engineering and mathematics. At least seven women, not enrolled at Georgia Tech, received extended career counseling through Tech's counseling center. Participants were placed on a mailing list to receive periodic information related to careers.

After the Workshop, a women's science career advisor was appointed in the College of Science and Liberal Studies. She has made career presentations to groups of college students, high school students and teachers, as well as discussing careers with individual students. Then, in November, a dinner forum focused on networking and career concerns was held for women students at Georgia Tech. One-hundred-and-twenty-six students and twenty four resource women participated.

On the follow-up questionnaire six months after the Workshop, forty-eight women indicated initiation of new career plans or action. Actions mentioned included investigating additional training and new jobs, taking courses, applying to graduate school, and requesting raises or promotions. The Workshop and follow-up activities obviously served as catalysts for career awareness and action by many of the women who participated.

INTRODUCTION

Upon learning that Georgia Tech's proposed 1980 Science Career Workshop Project had been funded, the director and planning committee began implementation. Resource Women were invited; printed career materials were solicited both for resource tables and handouts; physical arrangements were confirmed; informational packets were prepared for distribution to attendees, and the program was advertised.

Announcements of the program were made by local radio stations, papers, and magazines. Letters were sent to the principals of area high schools suggesting each one send a teacher who could then share the information gained with their school's students. Letters were also sent to the mathematics and science chairpersons of area colleges requesting their assistance in informing their students of the program. And, finally, announcements were sent to Georgia Tech's junior and senior women and faculty wives. All techniques were effective and each produced some applicants.

Of the one-hundred-and-sixty women accepted, one-hundred-and-thirty attended, plus nine walk-ons. The Ethnic distribution was sixty-eight white, twenty-five black, seven oriental, and thirty-nine unknown. The highest degrees held by the participants were distributed as follows: fifty-eight high-school diplomas, forty bachelors degrees, twenty-four masters degrees, seven doctorates, and ten unknown.

WORKSHOP DESCRIPTION

The Workshop started with coffee, registration, and a welcome by President Joseph Pettit. Then, the first panel on Career Paths and Opportunities was introduced. It consisted of Linda Saunders, Nancy Walls, Edith Martin, Marsha King, and Ann Rice. Each panelist shared insights and information derived from her own career. Exerpts from their remarks are included in the Addenda. Following the presentations, panelists responded informally to comments and questions from the audience.

At 10:30 a.m. coffee and cokes were provided after which each participant chose one of four smaller group activities.

Norman Drews, a college relations and recruiting professional with IBM, conducted a session on resume preparation and interview techniques. He pointed out characteristics which produce both positive and negative impressions on potential employers and suggested some practices which promote success.

Barbara Darby and Jim Sampson, counselors heavily involved in career advising in Georgia Tech's counseling center conducted a session on career exploration. They suggested search techniques and described a computerized system available on campus for investigating potential careers. Workshop participants were invited to use the system and other counseling center services during the next year.

Helen Grenga, Associate Dean of the Graduate School at Georgia Tech, Margaret Mermin, a physician in private practice and Marsha King, an Atlanta lawyer talked with those interested about the realities of graduate, law, and medical school. They provided information on school selection, the application process, financial aid, admission criteria, and what it's like after you get there.

The fourth activity during this period was a slide and tape show entitled "A Tale of 'Q'". This show by Rosabeth Kantor is an excellent commentary on what it's like to be the only woman or other minority person in a work group.

Lunch was a leisurely buffet with the resource women distributed at small tables to facilitate informal conversation. Following the luncheon, members of the career concerns, problems and lifestyles panel were introduced: Jo Baker, Associate Vice President for Academic Affairs at Georgia Tech; Mike Donahue, Director of Corporate Relations and Placement at Georgia Tech; Richard White, District Sales Manager of Dow Chemical U.S.A.; Gloria Shatto, president of Berry College; Margaret Mermin, a physician in private practice; and Toby Block, chemistry laboratory manager at Georgia Tech. Exerpts from their comments are included in the Addenda. As in the morning, the presentations were followed by interaction between the panelists and audience.

After a break, participants chose among a large number of small group sessions. There were four rap sessions. The first was led by Alice Cunningham, chemist; Margaret Mermin, physician; and Nancy Walls, biologist. The second was led by Karen Schultz, mathematics educator; Gloria Shatto, economist; and Edith Martin, computer scientist. The third was led by Helen Grenga, chemical engineer; Toby Block, chemist, and Linda Saunders, chemical engineer. The fourth was led by Carolyn Meyers, mechanical engineer; Ann Rice, IBM manager; and Jo Baker, psychologist. There were slide tape shows on Interviewing, Science Careers, and a repeat showing of "A Tale of 'O'". Participants were also given the opportunity to go over to Georgia Tech's Career fair and talk with representatives from over forty companies which hire scientists and engineers. The last event of the day was a reception where everyone could relax and talk over the day's experiences.

EVALUATION

Evaluation feedback was very positive. The most often expressed sentiments were hope that there would be other workshops and regret at having to choose among the small group sessions thereby missing some of them. One-hundred-and-sixteen participants returned evaluations producing an overall average rating of 4.1 on a 5.0 scale. The afternoon panel on Career Concerns, Problems and Lifestyles received the highest individual activity rating, 4.3 out of 5.

Six months after the Workshop follow-up questionnaires were sent to participants. Sixty-three responses were received. Of these, forty-eight women indicated that they had initiated new plans or career action since the Workshop. The numbers of women taking each action were as follows:

<u>Number</u>	<u>Action</u>
16	Took course in mathematics, engineering or science-related subject.
4	Took management course.
23	Investigated additional professional training.
10	Applied to graduate school.
27	Investigated a new field.
14	Investigated a different job in the same field.
5	Requested a promotion or raise.
15	Undertook other actions.

The answers to two questions on (1) improving the Workshop and (2) reasons for underemployment and unemployment of women and barriers to solving these problems are included in the Addenda.

The questionnaire responses indicate that the Workshop was a success in terms of providing information, encouragement, and motivation to the attendees.

CONTINUING ACTIVITIES

A number of continuing activities have been undertaken. A science career advisor for women was appointed and has discussed career concerns with many students. The science career advisor also made a number of career presentations to groups of college students, high school students, and high school teachers. A consortium was formed with representatives from Agnes Scott College, Spelman College, and Georgia State University to promote activities aimed at increasing the number of women in science careers. The consortium has sponsored two workshops and a newsletter so far.

The most enjoyable activity among the continued efforts was a dinner forum for women students at Georgia Tech on November 22, 1981. It included a panel presentation, followed by informal discussion and dinner with a large number of career resource women.

The panelists and their topics were:

Suzanne Imes	"The Masks Women Wear"
Veronica G. Wright	"The Transition from School to Work"
Julia Howell	"Women and the Work Environment"
Jan Botz	"Networking"

One-hundred-and-twenty-six students registered for the forum. Twenty-four women from industry and seven from academia were recruited as resource persons. Students rated the forum 4.4 out of 5 in overall effectiveness and 4.6 out of 5 in enjoyment. A list of participants and some results from the forum evaluation are included in the Addenda.

There have been a number of spin-off activities which, while not a part of this project, were influenced by it. One of Georgia Tech's counselors, after participating in the Workshop, developed a series of tapes using faculty and school directors to describe career opportunities in their areas. These tapes are maintained in the counseling center and used by many students. Each tape is 20 minutes long and follows a standard format. The College of Management sponsored a one-day career workshop for their majors. And, in May, 1982, a one-day Women's Fair was conducted on-campus utilizing some of the panelists from the September, 1980 Workshop.

1980 WOMEN IN SCIENCE WORKSHOP

PANELISTS AND RESOURCE PERSONS

E. Jo Baker
Associate Vice President, Academic Affairs
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-5058

Toby Block
Chemistry Labs Manager
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-4090

Alice Cunningham
Chairman, Chemistry Department
Agnes Scott College
Decatur, Georgia 30030
(404) 934-2221

Mary Carmichael
Associate Director
Ajax Placement Center
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2550

Barbara Darby
Counselor, Dean of Students
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2575

Norman A. Drews
College Relations & Recruiting
I.B.M. Corporation
400 Colony Square, Suite 1111
Atlanta, Georgia 30361
(404) 885-6200

Colleen Donahue
Acting Director of
Special Program
College of Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2000

Mike Donahue
Director
Ajax Placement Center
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2000

William H. Eberhardt
Regents Professor
Chemistry Department
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-4026

Helen Grenga
Associate Dean, Graduate School
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-3090

Mildred Graham
Associate Professor of
Curriculum & Instruction Dept.
Georgia State University
University Plaza
Atlanta, Georgia 30303
(404) 658-2518

Marsha King
Law Offices of King & King
15 Peachtree St. - Suite 808
Atlanta, Georgia 30303
(404) 577-6450

Edith Martin
4 Bentley Manor
Atlanta, Georgia 30327
(404) 955-2852

Margaret Mermin
M.D. - Private Practice
501 Seminole Avenue, N.E.
Atlanta, Georgia 30307
(404) 523-0689

Carolyn Meyers
Instructor, Mechanical Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332

Judy Morgan
Tillinghast, Nelson & Warren
3340 Peachtree Road
Atlanta, Georgia 30026
(404) 261-5420

Ann Rice
Director, Marketing Strategy
& Planning
I.B.M. Corporation
P.O. Box 2150
Atlanta, Georgia 30055
(404) 238-5512

James Sampson
Counselor, Dean of Students
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2575

Linda Saunders
Research Supervisor
Marshall Laboratory
DuPont
P.O. Box 3886
Philadelphia, PA 19146
(215) 339-6599

Karen Schultz
Department of Curriculum
& Instruction
College of Education
Georgia State University
University Plaza
Atlanta, Georgia 30303
(404) 658-2518

Gloria Shatto
President
Berry College
Mount Berry, GA 30149
(404) 232-5374

Nancy Walls
President & Chief Executive Officer
Applied Biology, Inc.
641 DeKalb Industrial Way
Decatur, Georgia 30030

V. Sherrill Watts
Assistant Dean, COSALS
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-3300

Richard D. White
District Sales Manager
Dow Chemical, USA
20 Perimeter Center East
Suite 2005
Atlanta, Georgia 30346
(404) 394-4141

WOMEN WHO ATTENDED THE "WOMEN IN SCIENCE CAREERS WORKSHOP" - September, 1980

1. Meryl Abramson
1990 Branch View Drive
Marietta, Georgia 30062
2. Madora E. Beard
620 Parkway Drive, #104
Atlanta, Georgia 30308
3. Mildred J. Beauford
2326 Aurie Drive
Decatur, Georgia 30034
4. Tambra D. Beddingfield
P.O. Box 31525
Georgia Tech
CAMPUS
5. Angela Denise Benson
P.O. Box 35684
Georgia Tech
CAMPUS
6. Sara S. Benzel
4411 Paradise Circle
Atlanta, Georgia 30339
7. Carol Berry
1331 Benning Place, #2
Atlanta, Georgia 30307
8. Isabella M. Blakes
2301 Godby Road, #E-16
College Park, Georgia 30349
9. Pat Cann
1490 Sunset Way
Morrow, Georgia 30260
10. Margaret Carpenter
P. O. Box 93
Agnes Scott College
Decatur, Georgia 30030
11. Jeannette T. Carter
4581 Riverwood Circle
Decatur, Georgia 30035
12. Ruth F. Cauthen
P. O. Box 1712
Spelman College
Atlanta, Georgia 30314
13. Linda W. Champion
652 Moselle Drive, S.W.
Mableton, Georgia 30059
14. Lynn H. Chandler
1516 Summit Springs Drive
Dunwoody, Georgia 30338
15. E. Ann Chastain
1165 La Vista Road, #129
Atlanta, Georgia 30324
16. Peggy Cloninger
738 Myrtle Street, #-2
Atlanta, Georgia 30308
17. Katheryn Cooper
P. O. Box 30356
Georgia Tech
Campus
18. Mary Therese Cox
848 Myrtle, #8
Atlanta, Georgia 30308
19. Rena Cresman
P. O. Box 34074
Georgia Tech
CAMPUS
20. Laurie Crowe
846 Dodge Street
Smyrna, Georgia 30080
21. Tambra E. Crowe
Route 1
Roopville, Georgia 30170
22. Josephine B. Davis
430 Colewooe Way
Atlanta, Georgia 30328
23. Sharon K. Davis
1517 Farnell Court, #8
Decatur, Georgia 30033
24. Katherine Dew
1373 #2 Benning Place
Atlanta, Georgia 30307
25. Gay DeWitt
P. O. Box 146
Agnes Scott College
Decatur, Georgia 30030
26. Kathy Dotzenrod
P. O. Box 34186
Georgia Tech
CAMPUS

27. Jeanne F. Dove
6800 Peachtree Industrial Blvd., #W-1
Doraville, Georgia 30360
28. Charlene D. Everette
3052 Lynn Drive, S.W.
Atlanta, Georgia 30311
29. Carol Fleishman
P. O. Box 32471
Georgia Tech
CAMPUS
30. Charmaine G. Frandsen
791 Saint Charles, N.E.
Georgia Tech
CAMPUS
31. Janet Fuqua
P. O. Box 34348
Georgia Tech
CAMPUS
32. Maryanne E. Gannon
4044 Warrior Trail
Stone Mountain, Georgia 30080
33. Gaye Geigel
7195 Twin Branch Road
Atlanta, Georgia 30328
34. Phyllis Goldfarb
35 Bransford Road, N.E.
Atlanta, Georgia 30342
35. Judy Gosha
1631 Stanton Road, S.W. B-4
Atlanta, Georgia 30311
36. Judy P. Gottlieb
4685 Hitching Post Trail, N.E.
Atlanta, Georgia 30342
37. Rita D. Grams
2696 Cosmos Drive
Atlanta, Georgia 30345
38. Lorna A. Graves
2401 Crestknoll Circle
Decatur, Georgia 30032
39. Sedigheh Hashemy
P. O. Box 33720
Georgia Tech
CAMPUS
40. Cynthia L. Hayden
1281 Brockett Road, #30-E
Clarkston, Georgia 30021
41. Karen Arlene Hellender
Agnes Scott College
Decatur, Georgia 30030
42. Billie W. Hicks
2755 Harrington Place
Atlanta, Georgia 30311
43. Marie E. Hill
P. O. Box 33165
Georgia Tech
CAMPUS
44. Lisa Hinely
678 Inglis Drive
Marietta, Georgia 30067
45. Lonnie M. Hollis
2008 Dodson Drive, S.W.
Atlanta, Georgia 30311
46. Pamela C. Holman
3004 Tree House Parkway
Norcross, Georgia 30093
47. Janet L. James
3425 New MacLand Road
Powder Springs, Georgia 30073
48. Ann F. Johnson
430 Westmong Road, S.W.
Atlanta, Georgia 30311
49. Geri E. Johnsonbutler
P. O. Box 4241
Atlanta, Georgia 30302
50. Kathryn P. Johnston
1685 Briarcliff Road, N.E. #1
Atlanta, Georgia 30306
51. Bonnie Jones
1685 Briarcliff Road, N.E., Apt. #1
Atlanta, Georgia 30306
52. Beverly R. Juhlin
6029 Dolvin Lane
Buford, Georgia 30518
53. Kim E. Keating
892 Amsterdam Avenue
Atlanta, Georgia 30306

54. Galen A. Kilpatrick
P. O. Box 33090
Georgia Tech
CAMPUS
55. Mary M. Kimberly
4444 Burlington Road, N.E.
Atlanta, Georgia 30302
56. Katherine King
1500 Holly Lane
Atlanta, Georgia 30329
57. Sharon C. Kleckley
233 Jamestown Court
Lilburn, Georgia 30247
58. Brenda J. Knowles
738 Myrtle Street, #2
Atlanta, Georgia 30308
59. Looi Kok-Weay
1307 Carter Road
Decatur, Georgia 30030
60. Christina Lawes
P. O. Box 243
Agnes Scott College
Decatur, Georgia 30030
61. Kim Lenoir
P. O. Box 236
Decatur, Georgia 30030
62. Diana P. Lerner
1774 Collingwood Drive
Marietta, Georgia 30067
63. Dale Lewis
1086 Monroe Drive, N.E.
Atlanta, Georgia 30306
64. Judith M. Linger
P.O. Box 36056
Georgia Tech
CAMPUS
65. Susan A. Littlefield
565 Dan Lane
Atlanta, Georgia 30324
66. Pau Fang Liu
Phoenix Hall
1043 W. Peachtree Street, N.E.
Atlanta, Georgia 30309
67. Kathy V. Lykins
547 Big Texas Valley Road, N.W.
Rome, Georgia 30160
68. Martha Mabry
Route #1
Five Points Road
Buchanan, Georgia 30113
69. Claudia B. MacDonald
895 Dean Drive, N.W.
Atlanta, Georgia 30318
70. Patsy C. Madariaga
3209 Majestic Circle
Avondale Estates, Georgia 30002
71. Kathleen McGuire
D.S.C.S. Residence III
1120 15th Street
Augusta, Georgia 30912
72. Shirley L. Marshall
2676 Oldfield Way
Decatur, Georgia 30030
73. Susan Martin
2000 Hastings Street
Marietta, Georgia 30062
74. Dr. Edward W. Matthews
205 Parkmont Court
Roswell, Georgia 30076
75. Anita J. McConnell
5929 Pine Creek Road
Forest Park, Georgia 30050
76. Cheri Martina McDonald
254 Rhodes Drive
Marietta, Georgia 30067
77. Linda D. McDonald
Apartment 3210-H
Postwood Drive
Atlanta, Georgia 30339
78. Elizabeth McElhenny
620 Peachtree Street, #1413
Atlanta, Georgia 30332
79. Sue McGlohn
1283 Briarcliff Road, N.E.
Atlanta, Georgia 30306

80. Lisa L. Merrifield
P. O. Box 272
Agnes Scott College
Decatur, Georgia 30030
81. Martha J. Mersereau
5890 Pinebrook Road, N.E.
Atlanta, Georgia 30328
82. Melaine S. Meyer
P. O. Box 30610
Georgia Tech
CAMPUS
83. Margaret Renee Miller
P. O. Box 442
Agnes Scott College
Decatur, Georgia 30030
84. Laura Mockridge
1031 Guys Court
Lilburn, Georgia 30247
85. Betty Mokgoatsane
270 Washington Street, S.W.
Atlanta, Georgia 30334
86. Alice M. Moore
2131 Columbia Drive
Decatur, Georgia 30032
87. Elizabeth R. Morgan
920 Scott Circle
Decatur, Georgia 30032
88. Sandi Nelson
472 Barnsdale Drive
Marietta, Georgia 30067
89. Maureen P. Nolan
99 Sheridan Drive, N.E., #7
Atlanta, Georgia 30305
90. Kathy Oglesby
Agnes Scott College
Decatur, Georgia 30038
91. Madeline Olson
1050 Creekdale Drive
Clarkston, Georgia 30021
92. Beulah M. Owens
840 Vaughn Road
Griffin, Georgia 30223
93. Anita S. Peek
56 Candlelight Lane, S.W.
Atlanta, Georgia 30331
94. Shannon E. Perrin
Box 313
Agnes Scott College
Decatur, Georgia 30030
95. Mildred Pinnell
Box 459
Agnes Scott College
Decatur, Georgia 30030
96. Jessica Posey
Box 202
Chemistry Building
Emory University
Atlanta, Georgia 30322
97. Judith Price
Box 22608
Emory University
Atlanta, Georgia 30332
98. Karen D. Quinn
252 First Street
Bowdon, Georgia 30108
99. Lydia A. Reasor
Agnes Scott College
P. O. Box 496
Decatur, Georgia 30030
100. Yvette R. Roberts
245 Devonwood Drive
Atlanta, Georgia 30328
101. Lucy C. Robinson
649 Moselle Drive
Mableton, Georgia 30059
102. Joyce A. Rodriguez
1778 Austell Road
Marietta, Georgia 30060
103. Margarethe Rust
Chemistry Department
Georgia Tech
CAMPUS
104. Rita Rutsohn
Augusta College
Augusta, Georgia 30910
105. Janifer H. Scanlon
3697 Donaldson Drive, N.E.
Atlanta, Georgia 30319
106. Carla Schultheis
2049 Winding Creek Lane, S.W.
Marietta, Georgia 30064

107. Lu Shu-Ying
P. O. Box 21979
Emory University
Atlanta, Georgia 30322
108. Carol C. Siegmann
1639 Deerfield Circle
Decatur, Georgia 30033
109. Sherry Sims
1187 Norman Street
N. Augusta, South Carolina 29841
110. Kate Y. Smith
2949 Greenoaks Drive, N.E.
Atlanta, Georgia 30345
111. Susan L. Smith
Box 508
Agnes Scott College
Decatur, Georgia 30030
112. Karen L. Spangler
2862 Whispering Hills Drive
Atlanta, Georgia 30341
113. Martha Stallworth
P. O. Box 23644
Emory University
Atlanta, Georgia 30322
114. Beverly Stark
P. O. Box 36560
Georgia Tech
CAMPUS
115. J. W. Story
6405 El Caudillo Court
College Park, Georgia 30349
116. Eileen E. Thompson
1026 Collier Road, N.E., #C-3
Atlanta, Georgia 30318
117. Janie M. Thompson
141 Feld Avenue
Decatur, Georgia 30030
118. Jane L. Tiesler
3016 Cumberland Club Drive
Atlanta, Georgia 30339
119. Karen R. Toney
P. O. Box 32276
Georgia Tech
CAMPUS
120. Stella Tucker
3705 Ponteверда Place
College Park, Georgia 30349
121. Karla D. Walker
Route 3
Bowden, Georgia 30108
122. Geanelvin Walton
1865 Wallace Road, S.W.
Atlanta, Georgia 30331
123. Cynthia Warner
128 Parkside Circle
Decatur, Georgia 30030
124. Sheree W. Warren
805 Piedmont Avenue, #7
Atlanta, Georgia 30038
125. Deborah T. Watts
2114 Myrtle Lane, Apt. 3-2
Decatur, Georgia 30033
126. Muriel Denise Weaver
1266 Cahaba Drive, S. W.
Atlanta, Georgia 30311
127. Martha Denise West
179 11th Street, N.E., #3
Atlanta, Georgia 30309
128. Debra D. Whearry
P. O. Box 1150
Spelman College
Atlanta, Georgia 30314
129. Ollie B. Wilson
3132 Hazelwood Drive, S.W.
Atlanta, Georgia 30311
130. Lynda J. Wimberly
Box 117
Agnes Scott College
Decatur, Georgia 30030
131. Wooi Tan-Yi
P. O. Box 398
Agnes Scott College
Decatur, Georgia 30030
132. Leng H. Yin
525 Tallwood Drive
Stone Mountain, Georgia 30083

133. Chooi Yu-San
P. O. Box 75
Agnes Scott College

WOMEN WHO ATTENDED THE WORKSHOP
(BUT DIDN'T FILL OUT AN APPLICATION)

134. Carol Albright

135. Cathy Edwards

136. Wilma Johnson

137. Kerry Keelin

138. Gloria Mischuk

139. Jane Weeks

Linda Saunders

Good Morning! My biggest problem today was not figuring out what to say but what to leave out because I only have 15 minutes. I am kind of glad the other panelists didn't show up because maybe that means I can spend some more time to go over what I have to leave out of this talk.

I'm going to start by saying what I want to talk about primarily is opportunities in technical fields working for major industrial companies. The company that I work for is Dupont which is a large chemical company, if you've heard of it. I see you have. I thought the easiest way to talk about career opportunities would be to talk about careers so what I've done is pick my own career as an example. So, you can see me and then match me up with the career I've had in the Dupont Company. And then I took two other people. One, Warner, is what we call a research fellow. He represents that mysterious other half of the dual ladder. I've used his career just to show that professional careers in your industrial companies do exist. And then the last person I picked is a fellow named Ed. I used Ed because there's an example of a fellow who's used his science background. Ed has a degree in chemistry as a stepping stone for a career in management in the company. So let me start.

This slide may look like a little propaganda because you can see the Dupont written all over it but just ignore the commercial. I wanted to start with this because I don't think you can really understand careers until you understand organizational structures. So, quickly, I just wanted to show that in the Dupont Company you have industrial departments and then you have staff departments. The industrial departments are those that make and manufacture and sell products. Staff departments are departments which help those people. So if you just look across there you will see the biochem department, the chemical dyes and pigments, fabrics and finishes, international department, petrochemical products, polymer products, and textile fibers. I'll come back to these because it's kind of important to my talk.

Well here's my career. I've a B.S. degree in chemical engineering from the University of Washington, graduated in 1969 or eleven years ago, immediately joined Dupont in June as you see. Always start with major industrial companies in June or before the 30th of June because then you get two weeks of vacation in your first year. If you start after that you don't get any at all so there's a little advice for you. I started working at the experimental station which is the basic research lab. I only have a bachelor's degree but I was doing process development work for Quiana Nylon at the time and started out as an engineer. Then in '79 in June, two years later, was promoted to research engineer and about that time also moved from process development to product development. There's an advantage to having women in textile fibers which is the department I was working in because it's pretty difficult to get a six foot man into a pair of panty hose to determine how they perform. So I brought a lot to the party. Actually, I found out that if they agreed with me I was an expert. If they disagreed with me, I was just a one woman wear test. And that didn't mean anything. It wasn't statistically valid. But non the less it all worked out for the better and in about a year and a half later I was transferred to the Chestnut Run site where Dupont does a lot of their product development work. The laboratory on this site is called the Textile research lab. And then I was promoted to senior research engineer doing the same thing. And then in '76 I transferred from the fibers department into the employee relations department into an entirely different kind of job. It had nothing to do with engineering. It was recruiting so I spent a year going from campus to campus recruiting.

Now the advantage to the company was that they were able to take an operating engineer on to the campuses so I could explain the jobs to them. The advantage to me was that this kind of a job is a management training job and it allows you to see how the company operates from a high level. You get to know the policies and get to know the people who run the company. And after that I went back to textile fibers for two months after that job. I was in that job for a year, went back to textile fibers for two months and then was transferred to the fabrics and finishes department as a supervisor of research. So now I was working on car paints which has nothing to do with panty hose but the same problem solving skills are required. And then about a year later I was transferred to the Marshall Laboratories which is also the F and F department, working on Teflon silverstone coatings. Has anyone heard of that? OK!. My research group is the group which has been working in teflon since 1958 and about 3 years ago it was my group that developed Silverstone, which has just taken off incredibly well. So that's my career. You can see I've been staying mostly in the technical field, moving from department to department within the company and moving from job to job within the company.

Now I'd like to show you Warner's. Incidentally, I'm picking men for these illustrations because I know these people and I know their stories. I could have just as easily picked women in the company like Marge Dubrenner who was a lab director or Faith Wall who was a manager of public affairs. But as far as I'm concerned, the only difference between the careers of a capable man and a capable woman today, in an industry, are the details. How fast and where you go in the company. The only difficulty that women face today as far as I'm concerned is catching up. Women are moving rapidly but have only reached a sort of middle management level. There're very few women yet who have gotten to the top and that's simply because it takes time. It will probably be your generation, not mine. I'm ten years ahead of you. It will be you people or your representatives who will be the CEO's and the vice presidents, the members of the board of major companies. But anyway, getting back to Warner. Warner, as I was saying earlier, represents an example of where you can go in a chemical company if you only want to do research, if that's your bag. Let's see. He got a degree in 1974 from the University of Chicago and then went on and got his Ph.D. Then he started working in fabrics and finishes at the Marshall lab and that's where his career has been. He has not moved around. His family is stable. He has stayed in the same area, lived in the same house, for his entire career. He started out as a research chemist and 9 years later he was promoted to staff chemist. You can see his initial career was rather slow. No promotion for 9 years. He became a staff chemist and then Warner skipped a jump. In Dupont there's another level called research associate. He went right past that to research fellow 9 years later. There's only one other level in the Dupont Company for professional people. It's called senior research fellow. I know of about 3 people in the company who have attained that title. And Warner will be retiring in two years. He's going to retire early at 58 and he's going back to the University of Pennsylvania to get a M.S. degree in archeology. He's going to use that as his second career. That takes guts. It also takes some money.

Let me show you what Warner's done. This is an example of a research organization. We have here this line which is what I've been talking about. You're going from chemist or engineer to senior research engineer to research supervisor. Or if you notice, you can go at the same level and you get the same amount of money if you go into research associate. So that's a professional line. And then both of you report to a research manager. I want to point out that the opportunities for bucks, if you're concerned about bucks, for research associate is greater than it is for research supervisor because they get what

they call compensation bonuses. If you invent something for the company, you get a percentage of the profits the company makes on that product. Then you see this talks about a senior research associate. Warner skipped those two jumps and moved to research fellow. He is now on par with the laboratory director. So he makes as much money as the guy who runs the laboratory. He also has great autonomy because he designs his own experiments, puts in his own proposals, and essentially does his own research within the company. OK! Enough of Warner.

Let's talk about Ed. Ed is another chemist. Being an engineer, I hold it against him, but not that much. He got his degree from the University of Toronto. Ed came in the company a year after I did. I came in in 1969. Ed came in in 1970. He's been in the F and F department his whole career, 10 years. But you can take a look at that list and see that he has moved around. Ed is on the fast track. He's one of those 5% of the people in the company who have been slated early as a president or vice president of the company. He's never been told this but you can surmise it from his career. If you look, you can see in some cases he's had a job less than 6 months. And not only that, you see it took him a while to get out of the laboratory. He was in the laboratory for about two years then he went to Willmington which is the headquarters for the company and started working as a product specialist, which is a sort of technical representative who goes out and helps solve customer problems. From there he just kept moving. I don't even want to go down thru the whole list. You can see he was a senior product specialist within a year later and then he was a technical objectives manager three months after that then he was a research supervisor less than a year after that, project manager in two years, national marketing manager in two years, worldwide product and marketing manager a year later, world wide marketing manager putting together a new business structure for one of the businesses, and then just recently he was promoted to national business manager which means that Ed runs a small business within Dupont. He's responsible for all of the marketing and manufacturing and selling of a product. It's packaging films, coatings like the kinds of coatings you see in beer cans. That's his product line. I would suspect that Ed's next move will be to assistant finishes director who reports to the finishes director who reports to the vice president of the department. And he's been in the company for 10 years.

I've been talking about moving around and so forth. Just let me give you an idea of what we're talking about. Within an organization like Dupont, you have various divisions and if you look at Ed, he went from the research laboratory in the research division and has spent most of his time in the sales division ever since. But there's a lot of different functions in there as you know. He went sales, marketing, and planning. Then the other function is manufacturing. That's probably my next move. I probably will move to plant technical superintendent as a next move. I'm not particularly excited about it either, I can tell you. But the advantage of it is that if you move from division to division within the department, you get a broader base of experiences which make you more qualified and give you more opportunities for promotion from then on. If you're interested in moving into the business end in a company, then you ought to move very early.

Does anyone have any questions so far? "Yes, I'm curious about move ."
"What's the impetus for this move?" "Do you know who picked out Ed to be on the fast track?" Well, Ed sort of picks out Ed to be on the fast track.

If you know him, you would see he just sort of has the where with all. In a company like Dupont it's all based on management by objectives. Performance is everything. If you accomplish your objectives, then you get rated highly. You get what they call a potential rating. You use your performance rating and your potential rating. But it's all based on your ability to accomplish the tasks that have been given to you. So that's up to the company or your management to determine. They say, "Hey you've really got it on the ball." "Where do you see your career going?" And in the case of Ed I think he recognized very early he wanted to go into the business side of the house, get out of research per se and get into running the business. We have an annual review. In that review they ask you, "Where do you see your career going?" "What are your career aspirations?" And you tell them that you're interested in eventually moving over here, eventually going up here.

"You say you probably will move to plant technical superintendent next." "What's that probably?" "Where did it come from?" "Is that your idea or your manager's idea, or a usual pattern?" OK! There's really no such thing as a usual pattern.

It's being in the right place at the right time and having the right qualifications for the job that comes up. Each time a job opens up in the company or in the department the computer spits out all the names of the people who are qualified for that job and who are ready for a move. They've gotten everything out of the job they're in now and they're slated for a promotion or a transfer to another kind of experience. The computer kicks these things out and that list goes to the manager who has the opening. He looks down the list and picks out those that he has heard about or he looks at their appraisal sheets and figures out that those are the ones he's most interested in. And then he'll start calling around and he'll say what do you know about so and so. Or, how much background has so and so had in this thing. Then he'll pick a person. Then it goes up to the vice president of the department and he approves the pick. If he approves the pick, then they go talk to that person and say, "Would you like this job?" If you don't want it, you can turn it down. Then you wait for the next opportunity that comes up.

Nancy Wall

Good morning! My name is Nancy Wall and as Virginia told you, I have been associated with this University for 21 years, forever. Coming from the University of Michigan, I know a lot of people here for better or for worse. But in the process of working here, as Head of the Department, I had public exposure which is what you all have got to have if you're going to go anywhere. If you're very shy shrinking violets, just don't be that way. Go home and do whatever psychological retraining you have to do to learn how to talk. Be outgoing. Put yourself forward and your intelligence because you are all bright people. You're all bright women and you have, as the young lady before me has said, now got an opportunity that my generation had to fight tooth, paw, claw, and nail to get. Now you have those opportunities that were opened up to you. By all means take advantage of them. As Head of the Department of Biology here at Georgia Tech, I had exposure to the alumni group -- Georgia Tech has a very, very strong alumni group because even though the students going here hate, loathe, despise, and abominate us because we are a very hard, very cold school

they find that that is the way in general the world outside is. People do not know you as individuals, they know your capabilities, they know your potential, they know what you do for them and they judge you on that basis. And it is a comparatively cold decision as the young lady said. They take a computer and put all the people's names in it. On the basis of that, without ever seeing you, they decide whether or not you are the one that's qualified for the job.

The Alumni Association hired me as a consultant and from that exposure a couple of people that I had contact with said you have good management capabilities. You're a very good, very eloquent speaker. By all means start a business. We'll give you a contract. That was in 1972. The contract was for \$30,000. I'd been bringing in research grants to Georgia Tech for about the same amount so I thought what the hell. And so with \$30,000 I started a business which brought in a little over 4 million dollars last year. So it has grown rather logarithmically. We expect it to do equally as well in the coming 5 years. I am at the top of the organization so if you have any questions about a chief executive officer and how they think, I will at least give you some insights into the way their twisted female brains work.

Let me show you some slides we have. My type of careers that I would be interested in would be people who have, unlike the young lady with the engineering background, backgrounds in science -- be they biological, chemical, or physical. I think that particularly in those sciences, the higher the degrees you have the more exposure you've had to the kinds of questions you're going to have to answer for your employer. So I recommend a Ph.D. degree if you have the time, fortitude, and the support, including money support and personal support from the people who are closest to you. Husbands, parents, friends, associates, mentors who give you some sort of moral support in the down moments which we all have on the way up or sideways.

This is a picture of our facilities here in Atlanta. As Virginia has said, we have offices all over the United States now. We have offices in Florida, North Carolina, Pennsylvania, have had an office in Ohio which we're going to reopen sometime in the Spring of next year, as well as the headquarters here in Georgia. We are a corporation that was founded in Georgia of which I am very proud. There are very few that are founded in this State. Most of them are northeasterners fleeing from the industrial smog up there, coming down to our fair territory. Our headquarters are in Decatur and we do studies in a number of different scientific areas. As you can see, they're very heavy in the biological sciences, in aquatic toxicology which is a combination of biology and chemistry along with analytical chemistry and microbiology.

For the people who are going to be performing those services in the aquatic biology area there is a chance for you, at least at the initial level, to do a great deal of field work which gives you outdoor exposure. When you're young, you enjoy that. It also gives you a tremendous experience base in how the equipment works, what the weather conditions will do to any kind of a schedule that you have in mind, and what kind of materials are found in the water if you are trained in a particular discipline. These people are looking for the kinds of grasses or vegetation that grows at the bottom of an aquatic estuary. The estuaries have become extremely controversial waterbodies around the world because they are known as the nursery grounds for all of the organisms that live in the ocean that will be used for food in the future as our terrestrial resources go down hill and our population continues to expand. So these people are actually

bringing up samples from the bottom of a stream that they can then bring into the laboratory and look at under microscopes. Again, if you're looking at sophisticated microscopes, these are what they call inverted microscopes so that you can bring the sample in and let it settle and never have to disturb it by human activities afterwards. And underneath that you see all sorts of beautiful things. If you are a specialist in looking at plants, the very, very tiny plants, the ones that you can't see with the naked eye are called algae and they come in all sorts of beautiful and exotic forms including these very, very long filaments. If you have specialized in animals, the microscopic animals that you can see, they are actually almost transparent. You can see all their internal organisms and it gives you a very good mechanism if you have any sort of a scientific research mind to try and find out what kinds of materials cause these things to develop normally, what cause them to undergo abnormal stress reactions, either death or being deformed, or being retarded in their growth.

The organisms that then grow up to be ones that you can see with the naked eye also have to go through very infantile stages. The fish, before they get big enough for you to eat, are very, very tiny larval forms. If any of you are interested in the marine sciences, there is practically nothing known about the different stages of development because we are a nation that has depended for years on our terrestrial resources which are immense, and have not had to look to oceanic resources for any of our food supplies. We are not as advanced as the Japanese or some of these island nations that have had to depend on the sea for years. As a consequence, we do not know a great deal about the marine species, including what they look like when they're babies. You get a tarpon or a king macro, or a dolphin, not flipper, but the kind that you can actually eat, and nobody really knows what their beginning stages look like because there has been so little work done on these organisms as they develop. Only about 25% of them have been taxonomically identified so there is a great deal of work to be done there.

In our organization we encourage people to both do research in these areas, publish papers if they have work that is scientifically publishable, certainly go to meetings, present their findings, as well as manage the project that they are going to be associated with. And in our organization the project manager is the jack of all trades master of none, is expected to do everything from the field sampling collection to the analysis in the laboratory to putting that into data sheets and computerized form, to look at the data and what it means, to write the reports and potentially to testify to the results in front of state, federal agencies. Once the analysis has been done, it is computerized, put on sheets, keypunched, verified, and run through a computer because we generate masses of data.

In the aquatic toxicology area which is an up and coming field, how many of you are majoring in the biological or chemical sciences? Good! As you know the United States government has passed a large number of environmental laws starting with the 1972 water pollution control act. The clean air act came along after that and now the toxic substances act and the resource conservation and reclamation act, all of which control the kinds of materials that can be put into our environment so we can keep the quality of life that we now have and enjoy including our very affluent society for future generations. This means keeping the water clean and the air clean. And the water includes the surface water that you actually see, the rivers, lakes, and streams and the water bodies that you don't see, the aquifers underneath the rock formation that you actually draw to the surface to use for your activities whether it be to fill

a lake or to run a power plant or to run an industrial operation like the chemical manufacturing of Dupont or the textile mills. The paper and pulp factories all have got to have water and they're usually drawn from deep, deep aquifer wells. Those then add to our activities including your human activities around the house. Garbage you dispose of, you dump it out somewhere in a land fill and all that chemical material undergoes whatever activities its going to have with its associated materials and that material then leaches back into the aquifers by perculating down through the soil with the water molecules that were the rain that falls on it and brings it back into the water bodies underground.

What effect these different chemical materials have on developing life forms has become very, very much an area of interest and concern. In toxicology, if you take biological organisms and expose them to these different kinds of chemical stresses, you will see how they react. In some cases, of course, they die. That's very obvious. But if they undergo retarded or abnormal development that is much more subtle and takes a considerable amount of study. We have large tanks where we keep such things as these fish and we will actually stress them with different quantities of chemicals. To make sure that the organisms themselves are reacting to the chemical and not reacting to some genetic abnormality, they have got to be raised in very, very standardized, very carefully controlled conditions. So we have our own cultural laboratory where we grow such things as small fish, water flees, shrimp. We go out in the field to such people as Dupont and Chevron Oil Companies and actually take these animals that are genetically pure, unstressed, put them in a test environment where you can actually take the material that is being produced even from the local household if you have to and mix it with source water in varying concentrations to see at what level the material that is being produced by man's activities has an effect, if any effect at all. That is toxicology and the fact that you're using a biological organism is biological toxicity or bio assay.

Terrestrial ecology! There is a very large controversy at the present time about the effects of the emissions from our multi-million dollar bankrupt auto industry as well as the emissions from anything that produces smoke, what effect this is having on the terrestrial vegetation, particularly food crops. The smokes, the hazes, the vapors, that are produced, when they get out in the air they interact with the water in the air, with other chemicals in the air, to produce different chemical compounds. In many cases an acid material such as hydrogen sulfide becomes sulfuric acid. Nitrogen oxide becomes nitric acid. This produces, whenever the rain falls, what they call acid rain. And when acid rain falls on a terrestrial environment, it changes the vegetation. So we have people who are taxonomists, people who are metabolism experts, people who are physiology experts who can tell you what is and is not a healthy plant, what quantity of it should grow in a particular area, or what kinds of animals, including this cute little mouse, that you can catch and look at. We do what is called live trapping. We look at these little animals that we catch and find out how many of them are in a particular area and what kind of foods they require and whether or not any change in that environment would decrease their food supply or their hiding places to raise their young so that they would not survive.

In the analytical chemistry area it is becoming very, very sophisticated in terms of the kind of equipment. I think Georgia Tech has a very, very well equipped chemistry department. I'm sure you'll get exposure to some of these instruments but you need to use this instrumentation to determine what these pollutants are out in the environment. And as of the federal register

of May 19 of this year, there is a long list of chemicals that have been published as being ones that are potentially hazardous. Heavy metals! Everybody knows that if you get mercury in your body, you don't live too long. Other heavy metals are equally as detrimental to your metabolism as well as polychlorinated biphenyls and the other compounds that you see listed on this chart. The instrumentation in the laboratory that you use to look at these samples can be anything from a total organic carbon analyzer to equipment that is designed to look at the different kinds of metals which is atomic absorption equipment. And you use flame ionization for the analysis of these materials in the environment or what they call a mass spectrophotometer, a very, very finicky instrument, even worse than us women. It is extremely temperamental. You have to have it about 6 to 9 months, like having a baby, to actually get it to produce some results. In microbiology, again, the organisms that will break down organic material to inorganic substances so that they can be used in the next cycle of life are analyzed for in the laboratory. PH, of course, is measured by this instrument which will tell you how acid or alkaline a situation is. And then if you are very, very good and very, very highly qualified, there are special projects that will be given to you by either government or industry agencies who want an answer to a particular question.

There are species around the world that because of man's activities are becoming what are called endangered or in many cases on the verge of extinction. And these species because they have not been of concern and therefore, no concern, no money, no work. There's very little known about many of them. The manatee is the aquatic cow. The sea turtle is an aquatic reptile. The eagles are airborne animals. You have orchids which are terrestrial plants. There are large numbers of endangered species and if you can do anything to understand more about the behavior of these animals, the metabolism of an animal, what makes it tick, what its breeding cycles are, you are in a very, very important and very significant research area. The sea turtles are one of these endangered species. We have projects off the coast of Florida. We are becoming, well it's not favorably known in the east coast, the turtle experts. The sea turtles are green loggerhead hawksbills. They go on an oceanic migration whenever they are first born and they come back, they're like the salmon, to the same beach where they were born to lay their young at least 2 to 3 years later. They are about 3 years old before they reach sexual maturity. In many cases they may be 5 years before they actually produce a clutch of eggs that will survive. And when they do that they mate right off shore and then during the night, always at night, the female crawls up the beach and using her tail, actually her tail, digs a hole in the sand and deposits her eggs. Where she is depositing her eggs is a real feast for raccoons so if the raccoons can find them, they will eat the eggs. If man comes along he used to collect the eggs before the endangered species. Then at one particular time, the young emerge from the nest, go back out to sea. Statistical information can be presented on declines or actually you can testify. Again, you have got to have the academic credentials to get up on the stand in front of a federal agency and testify to the results that you have produced. If you get your education, if you actually work your way up to the rank, you can become what is called an expert witness, which we are doing here in front of federal agencies in an adversary hearing where a particular industry was accused of a detrimental activity, which was not totally true and we are presenting qualified scientific evidence to the contrary.

Edith Martin

Good morning!

When we have no apparent direction, we are said to meander. That's what I was doing in the parking lot this morning. When we do have a course, it's called a path or a direction. Have you ever wondered why they call it a career path and not a career straight line, not a career conveyor belt? We are coming to some important realizations; one, that career decisions are not clear decisions and, two, that career decisions are not permanent decisions. Our educational foundation, for the most part, was a general preparation followed by some fundamental educational decisions such as liberal arts versus engineering and science and some more educational decisions, and for some of you more educational decisions.

Now, how does one apply what they have learned and do you ever back track or start over if a wrong decision is made? By now, we should know there is no going back. We only move forward. The whole tree here, not any of its parts, is a picture of my own education. However, it is really too simple and would have one believe that this education does not have overlaps. The next viewgraph. More appropriately, we can see that education in any area has branches which overlap many educational and professional domains. This is a truer picture of my education and career tree. The beauty of this tree, like yours, is that it always grows upward, sometimes a little horizontal, and outward. It's always reaching for new experiences.

Now, your path is the foundation for your future. It makes you special and it makes you unique. People use to laugh at the liberal arts major turned computer scientist. When I first started in the computer field, I was asked what my undergraduate degree was in and I would say harhumpugy and they would say, "what"? And I would say very lowly "psychology" and they would roll on the floor laughing. And then someone would stand up and say "oh surely you have some other background" and I'd say "oh yes". And they'd say well, what is it? And I'd say "hohumpugy" and they'd pursue "what"? And I'd say, very reluctantly, "philosophy" and they'd start laughing again. Well, today, there's no better combination than philosophy, psychology, biology, and computer science. The moral is don't hide your talents. Present them proudly and don't second guess their usefulness. Talents other do not know about, you may never use. Their uselessness then may be a self-fulfilling prophecy.

When evaluating careers open to you, let me share some thoughts from my own introspection. There are only two real guarantees for failure. One is to do something that you're not qualified to do and the other is to do something that you just blatantly don't like. Now some of you are underemployed and don't like it. Are there people who are overemployed and love it? You bet. And will it last? Probably not. So stay on course. Know yourself and be very honest with yourself. Remember that you are a changing person. Those of you who are in the school are not today as juniors and seniors the same people you were as freshmen. Now I know that I bore easily and I know that I like a challenge and I know that when I get to the top whatever that means I don't want to be alone and I know I don't like regimentation, and I know that I am tenacious, undumb, 5'5 and after that things get fuzzy. Our objectives today are to help reveal the career opportunities that exist through which you may realize your potential and give some insight into what may be required to do that. Now there is room in any field for someone who's outstanding. If you feel unprepared or disinclined to establish instant world fame in some

specialty, then perhaps you should look for a career that will satisfy your lifestyle, your professional desires, and your financial need and, hopefully, one that will require your services.

Now, I chose computer science because to me it's exciting, it's changing, it's challenging, it's rewarding and it's one of the few careers in which eccentricity is the job requirement. Now on the serious side, let me give you some very positive facts. At the National Computer Conference which is held annually, the following statistics were presented. As you can see, there is a growing requirement for computer science graduates. Twelve jobs currently to every single graduate and this is at all degree levels, except when one is looking at academic positions for Ph.D.s in which case the ratio is 35 to 1. Now let me at it. And why is that ratio so great? Well, the reason the ratio is so great is that the academic positions financially cannot keep up with industry and there's such a shortage in the field that industry will buy the Ph.D. out of the academic field. Okay, the next viewgraph. Employment of scientists, and engineers at all degree levels will grow by 43% in the 1978-1990 time frame. That's a very impressive growth. Next.

Employment of all engineers combined will grow by less than 25% with a major growth area being in the energy fields or environmental fields. All other major sub-fields will grow at a rate of 19 to 28%, now these are more mature fields. Employment of computer scientists will grow by 110%, psychologists, geologists, statisticians, economists 40%. Slow growth occupations include atmospheric scientists, physicists, astronomers, and mathematicians. Now all of these will grow at 10% or less. 250,000 new engineering jobs are expected during the time period designated. 650,000 new science jobs are expected in this period, with nearly $\frac{3}{4}$ in the area of computer science. Computer science and computer-related jobs for this time period are shown here. Of these jobs, only programmers and system analysts usually require higher degrees. The 1978 total is 429,000. In the ten year time span designated the increment is 471,000 or 110% increase. Now this is a very narrow spectrum of jobs present in the total computer science job picture and what that says is that the total number and perhaps growth that I have presented may be grossly underestimated.

According to the National Center for Education Statistics, the total degrees '79-'89 in the area of computer science will be as shown here. The dearth of doctorates exists because would-be Ph.D.s are literally bought out of the program by an industry in need. The total of all degrees will be 136,720. According to the Bureau of Labor Statistics, the computer science demand will be 471,000 in 1990; according to the National Center for Educational Statistics the supply 136,720. That represents a deficiency of 334,280 people. What does that mean? That means that every person in this room and their brother could become a computer scientist and not noticeably perturb that number.

Over the last quarter of a century, the computer and data processing fields have grown steadily and tremendously. The industries listed here are among the 40 highest research and development spenders in the nation. Their joint expenditures are about 4.8 billion dollars annually. This is approximately 21% of all the private sector research and development dollars.

Other large areas, of course, are the energy and environmental research activities areas. From this information, we can see that there is both a requirement and financial support for computer scientists. Unlike many other specialities, computer science pervades all fields and nearly every aspect of our modern life. A cut-back in any single application is not likely to have a significant impact on the field of computer science as a whole. Now this was not true for physicists and aeronautical engineers involved in the space program.

Persons wishing to pursue a career in computer science or advanced education in this area should have the following basics in hand: if one is going into a graduate program and is a non-ICS, undergraduate, they will most likely have to make up deficiencies in one or more of these areas. Some of the areas in which one might specialize are presented here. Some of these pertain directly to the application of computers to other fields. What that means is that if you have a background in some specific area of engineering and decide that computer science might be of interest to you, your background in that area of engineering, be it chemistry, civil engineering, or even physics, which to some is not engineering, will be very useful to you and that it is not a piece of background that should be neglected, rejected, it will improve your value. Computer science does not stand alone. It stands as it serves other fields and so your other capabilities are a plus not a minus. Some of the hot topics of the day are presented in this viewgraph. VLSI represents very large scale integration. VHSIC, very high speed integrated circuitry. Now this is the technology which underlies the newest developments in the computer science field. Some of these areas such as text processing, information systems, can be nicely combined with a background in industrial engineering or industrial management.

The computer science department at Georgia Tech is a growing one. Its current enrollment and enrollment history are shown here, along with a head count of its graduates. Note that these numbers do not reflect ICS minors, nor casual participants in ICS courses. That would bring the number to approximately 850 people per year. Now there are very few people in this room who could not benefit by at least one or two courses in computer science. Time does not permit a thorough presentation of the requirements and opportunities in this field. I have, therefore, brought along a limited number of booklets describing the degree programs in ICS at Georgia Tech. They have some nice descriptors of some of the sub-fields. This information can be directly useful to you if you are interested in a career in computer science, or serve of indirect value if you feel that it might support some other career interest that you might have. Computer science is a nice place to build a career because you have to work very hard to be bored. Thank you.

Marsha King

My name is Marsha King and I am attorney and also a graduate of Georgia Tech. I graduated from here in 1956. I became a computer programmer and let me tell you, it isn't for everyone. There are those of us who cannot look at all those little zeros and ones for very long without one's mind wandering and I became one of those. But I had a very stupid quality. I didn't know that you had to like what you were doing. If I had been through a lecture like this when I was in school I might have known those two things that makes you fail, not liking the little zeros and ones and getting kind of lost with the computer cards in the machine and the paper. That was really all there was, just the four of us. I struggled along with it for four and a half years. I was able to conceal the fact that I was probably the most incompetent computer programmer walking the face of the earth by the fact that I had some very fine degrees, among them one from Georgia Tech. So people did not assume that I was as incompetent as I really was. I could badger a bit. Anyway, I finally gave it up at the request of my employer. Of course, I was just devastated. I had no idea why I couldn't cope with that particular job. Later, I was to learn I needed a lot more people contact. I needed to be with people, to talk with people and, as it turns out, to have them shrieking at me from early morning until late at night and usually during the middle of the night. This seems to satisfy me greatly. I don't know if that will appeal to anyone else but that's what my career has eventually ended up being.

After I finally got fired from my last job, and let me speak to those of you who fail in life at least for a while. I got fired from almost every job I ever had until I finally became a really successful attorney. I am so glad that there is something out there for me. It was really looking hopeless, I always seemed to do the wrong thing. I always seemed to be daydreaming when something important was happening and I didn't quite notice; you know like when the boss was looking my mind would be wandering. After I finally lost my last job, I was so devastated I didn't know what to do. I had gone into programming at least in part, because I thought that was one place women could go. I went to Georgia Tech, I don't know why because at the time that was one place where women really couldn't go. When I went here, I entered in 1965, and it is hard to believe but my mother had to go begging to the Board of Regents to approve my right to go here. I had to get special permission even though I was academically admitted. I was entering Graduate School and I think women could only go if there was no other place they could go in Georgia. So mother convinced them that we were so poor that there was no place else I could go in Georgia, so I did get to come here.

I didn't know what to do with myself after I failed so dismally with programming. So, I decided well, what the hell, I will just raise Cain. At that time, there was a great deal of blatant injustice that women were having to deal with in the world and so I decided I would have to do something to help it. Somehow I think I was so lost I wrote to everyone I could think of trying to figure out what it was I could do. I got several letters back from women's organizations telling me "we need you". "We don't have any money and we can't pay you anything but we need you." I was living in Dallas at the time and I really spent probably the most helpful two years in my life working on sex discrimination, working to fight this problem. It seems like ancient history, but there were banks in Dallas that simply had 300 male officers, 1000 women and had never had a woman officer and the President vowed there would never be one. It was that blatant. So I got together with some other women and started

filing charges against these various banks under some of the regulations that prohibited them from this discrimination. The organization I was with, I was with the Woemn's Equity Action League, grew and we filed charges against universities and then finally all of us ended up going to law school. So, the organization finally met its demise when we all found jobs that we could do.

I did work so much with law during that period, helping people, that I decided perhaps I really would enjoy law. Although the thought of going back to school at my age which was then 30, was "I just can't do it, I am too old. I will not be able to keep up with all those 20-year olds and my brain has atrophied and I just don't know anything". For lack of anything else, I finally did go to law school and I loved it. Compared to physics, it was so easy. There was only one other fellow there who had a scientific background. I think there was a friend of mine who had a masters in electrical engineering from Tech. I mean we were upset when we had Saturday classes at 8 o'clock. Oh my goodness, it was terrible. But at least we could find a place to park. But none of the law students had had to study. Most of them had been in history or the kind of discipline in which the gift of gab is very helpful and so they simply had not had a lot of academic discipline forced on them. For them law was very slow and painful. For me who had struggled with quantum mechanics, well it was like Lady Chatterly's lover, it was such a breeze. We covered a hundred pages a night, I used to spend a week on one chapter in physics. In fact, sometimes longer than that. It was just so slow. But, law to me was so breezy and easy intellectually. There was an awful lot of it, quantity passes for difficulty in law school. But, for someone who has a scientific background, it is so much easier than most of the scientific disciplines. That really is a blessing. You usually do better when you go back to school than you do when you go the first time. Because when you go at an older age, your life is usually a little more settled and you are over some of the problems and some of the instability that you have when you are very young. Anyway, I had finally found something that I could do. I was so grateful for it, after all those years.

So, I was breezing through law school and in the middle of my second year, my husband who had been providing all of these opportunities for me for about five years, my working on behalf of women and then going to law school, he got laid off. So I was able to get a job and I started putting him through law school. After putting myself through and my husband through, I was like super-woman doing so many things. Then I started my own firm. I worked with another attorney for about six months. I had been working with a group of unions in Atlanta to start a referral service and so when I started my own firm I had about 15,000 people being referred to me through their union. So I had plenty of clients to start with and that is the hard part. I practised two years before my husband graduated. During those two years, I had a very, very hard time. Now, I had plenty of clients, but I did have a problem asking for money. And, you know, as you can imagine when you are supporting yourself, that created some difficulties for me but fortunately my husband finally graduated and he was able to ask for money. I had all this huge group of clients there, so since he got out we have been able to be financially successful, as well as to be able to help a lot of people.

We have a law firm, we do have a special service in that we give free advice to anyone who calls over the phone. This is part of our service with the unions and to our consumers. So, we tend to have a great many clients and we are able to help an awful lot of people from morning until night every day. It is just so

wonderful. I feel so good when I can help somebody and I feel so sad when I can't. But, most of the time, I can help people with the solutions to many problems and that is very gratifying to me. I never get bored because there is always someone that has a very serious problem that I can work with. Somehow that captures my imagination. I guess I need to feel needed by other human beings so I can feel that each day is very meaningful. I know when I go home whether I have really helped somebody or not. I also know when I can't and that is very heartbreaking to me.

I do practice with my husband and this has been a very wonderful part of my career because we have sort of a Mom and Pop business and we have several other attorneys working for us. We both have complimentary skills and we get to help each other all day and that's a real nice feeling too. Now, we have had a baby and, well, I had the baby. I know I am very fortunate but I have demanded that my husband take an equal share of the child-care. I had it better actually before. I had him doing all the housework. But I don't now since we share the child-care. Because we have our own business we are very flexible. He goes to work very early and I stay with the baby and I go late, but I work late, and he comes home early to be with the baby. So, she has her parents with her a great deal of the time.

With regard to the future, in law, somehow the economy keeps absorbing an enormous amount of attorneys and the latest projections are that all of the recent graduates, I think 95% of them, have law-related jobs. We have a very litigious country. It's become more so. Also, law is so flexible that you can go into so many related fields. It doesn't seem to take any background really and you don't have to practice law necessarily if you learn it. But I guess it helps you understand the very basis of the functioning of our society so well that people are able to do a lot of other kinds of jobs after they have legal training. And, so, even though there are some shortages of jobs in terms of the most favorite spots, San Francisco, New York, and maybe even Atlanta, people seem to be able to find legal or legal-related jobs fairly easily. Of course, you do get paid very well if you are an attorney. I am not sure you get paid as well as you do if you are an engineer. But, somewhere in the same neighborhood. It is an area in which you can also effect social change and it gives you a sense of having a lot more control over your own life. For example, for the people who parked illegally today, I feel more confident than anyone else that I am going to be able to get my car back.

I would like to ask just a few questions of you. How many of you in the audience have children at this time? Okay...are there any people who are definitely planning on not having children? Okay..it's a very important consideration. One of the things that the women attorneys have been able to do is to pressure their companies, whether they are working for government, business, or whatever, to make the kind of changes we need to be able to make, to have a career and a family. And we definitely have got to have some changes in terms of time, daycare, and flexibility; both in terms of hours, in terms of periods off to be with the children. Those changes have to be made. I am so glad that many of you are going to get in there and pressure for those kinds of changes. Believe me, I will be right there helping you. I am a little bit shy about speaking about all my failures, except that I think there are some of you in the audience who will experience that same problem. Don't let it get you down. Just keep on looking until you find something that you really can enjoy and can give yourself to.

My name is Ann Rice. I am with IBM and I am one of their Executives in the General Systems Division which is located here in Atlanta, Georgia. I was asked to tell you a little bit about my career and then about women moving ahead in management in companies. Now, IBM is a very large Corporation so I will be speaking to you about large corporations. I am sure it is different depending how large the size of the organization and how you are located. We are a high technology corporation. I think most people assume that you have to have some technical degree. There are a lot of people who work for us who have business majors or do not have degrees. IBM has about 300,000 people employed across the country and the world. I don't know how many countries. I think the latest count was about 29 different countries that we are in. So, if you are getting out of college like I was in 1965 with a math degree and you see a company that size, you have to ask yourself where do you start, who would you talk to, and what do you want to do.

I decided that my degree was in mathematics and, at that time, computers were kind of related to that. I had a few computer courses in school and I had some business background. IBM was interviewing on campus and that is how I got the job. I was interviewed by about 4 or 5 different companies and it just sounded like maybe it was me. I was lucky. I didn't make the wrong decision and from what Edith was showing about the future of it, I still haven't made the wrong decision. So, I have been very fortunate as to where I have ended up and that I like that type of work. Computers don't bother me, neither do ones or zeros. We get along fine.

The first thing you do when you get into a company like IBM is you have to be technically skilled at a particular job. You don't have the management skills nor do you have the experience or the depth to know about anything else. But you have to have the technical skills to get you in the door. I was just at Penn State with executives from corporations like Exxon, GM, Boeing, Hewlett Packard and they all said about the same thing. You have to have a degree or skill or technical area of expertise and you get in and you do that job and you do that job well, and that is how you get in the door.

Now, when you hire in with a company, the other thing you ought to look at, as a woman, is how do they promote in that company? IBM promotes from within; therefore, you don't reach a certain level and someone from x,y, z company comes in and now you say "Now, what do I do"? So, it promotes from within, except for the legal group, and there we hire professional lawyers and we do a lot of outside contracting with legal firms. We also hire from without for advertising and in our communications group. Other than that, it is from within. So you start at the bottom and work your way up to the top which is an advantage because you can then plan with that particular company.

The other thing I think that is key is, you ought to ask what the affirmative action program is in that company and it must be from the top down. You see, as you get promoted, what happens is that there are two individuals, one wants a job and one wants to hire someone. So you have to create the need that he wants you. Now, you get a lot of bias as you work up through a company... male and female...and different attitudes and such. I believe affirmative action is key in a corporation to help you move ahead so you don't get stopped on your way up. There is someone from the top looking down, some people trying to help move you up, so you have it coming from both ways. Absolutely, check on affirmative action programs and ask where the other women are in the company, and who some of the executives are.

I have a lot of girls who are even in high school coming by asking how did you get where you are and what you are doing. Those, I think, are the two key things. After you get in your job and get your skills honed and you really know what you are doing, then you can start talking about what do I do next because if you are not doing the basics right, you are not going to have any next to talk about. Now, I find that most women, and myself included, come to the job market and talk about career but really don't understand what career is. You see, a man comes to the job market believing that he is going to work forever, that he is going to be the sole provider and, therefore, he aspires to some long term objectives of getting somewhere within the structure or the organization. Women do not necessarily think that way. They may think two, three, five and then it is nebulous about what are they really in there for and what is it all about. You must have some objectives, you must have aspirations and you must have expectations to go anywhere in a company, because if you sit there and just do your job well, that's not enough. You may end up anywhere...it's the old Alice in Wonderland. If you don't care where you want to go, then anywhere will get you there. No one is going to come out and find you necessarily. Now, there is a lot of timing and luck that happens along the way too and I would be the first to admit that. There is also an advantage in being a woman because they are looking for good women if there is an affirmative action program. Therefore, you can be singled out automatically by being a woman and being good. That's not enough.

Now you are in the company and you decide to think about career. You can make two choices if you are a technical person at the bottom level as I was. I was a systems engineer. You can decide that you want to stay a technical person and maybe go into the research or development or to the lab environment. At IBM, you can do that. You can also go back and get your master's degree and doctor's degree, and they have an educational program to help you with that, or take an educational leave and come back. And you can decide to do that. Those people are in the do mode. They like what they are doing. They are going to be specialists in that area. They are going to go into the R&D function. The other option you have is to go into management. There are technical managers and there are other kind of managers, financial managers, marketing managers and all kinds. When I moved ahead I looked at the top and said "look I think the criteria to get there, and I found that it is true that we are a marketing-oriented company; therefore, I should have some kind of marketing-type experience because we sell computers, we make them and we sell them". I am not very good on the manufacturing. I don't have an engineering background, so I don't think I want to go that route. But I do have some business and I do have math and technical skills and I do understand computers, so I think I will go up the marketing route. You make those kinds of decisions very early on in your career, probably two or three years into the business. Then, the next decision you have to make is what kind of manager do I want to be. Do I want to be a business and financial manager? Do I want to be a technical manager? I decided to go into the business side.

I would tell you that if you are going to be a chief executive officer of a corporation the size of IBM or even smaller, I think Linda that you would say the same thing, you have to have some financial smarts. You have to know how to run the business, make money, pay people, etc., etc. So, I feel that in order to be a top executive, I need financial strength, I need marketing strengths, I need business strategy types of strengths. And I need to have my technical strengths because we are a high technology division and I have to keep current on competition and where we are going in order to build strategies. Therefore, in my career, I have selected to go into systems engineering, then I switched to marketing and became a marketing manager, sold computers. The next thing I did, I went into sales management and I was a branch manager in Arizona. I handled the whole state of Arizona, southern Nevada, sold computers to all types

of corporations, ran my own little company. I was responsible for all of the revenue that our division made in that State. I had my own staff, my own budget and I ran that business.

When I got through with that job and I did it fairly well, I was promoted to assistant to the vice president and then in that job I was to learn the strategies on how the division works in the corporation and so on and so forth. You have to understand what makes the thing tick, how people make decisions. And, that, I think was probably the most value to me as a woman, because there is a formal structure that says you go from Point A to Point Z and it goes through these checkpoints. Then there is an informal structure. Now the informal structure can be anything depending on the company. But at IBM, the informal structure is you do an awful lot of selling before you walk into any meeting. In other words, you have to deal with each person that is going to be in that meeting and find out where they stand, negotiate, sell them on what you are trying to accomplish before you even walk into that door. If you don't have those skills to negotiate, be tough but compromising, firm, decisive, but not alienate them, aggressive but not so they think you are one of those pushy broads, you are not going to be successful. And, it is a fine line and that's where you start to question should I be a man or should I be a woman, how tough should I be, he's saying that because I am a female, he's saying that because he doesn't like me. I think sometimes you can carry too many things in the back of your head and assume too many things and hurt yourself in the end. I have seen too many aggressive, and I mean aggressive women, just alienate every one. You have to learn how to negotiate to move ahead in the business, and that is something you learn. I have found that you can combine being a female at home and a female at work and not going overboard, either way. You dress professionally, you act professionally, and people will treat you professionally. You're going to meet those male chauvinists wherever you are, just as they're going to consider you one of those aggressive women that they don't know how to handle. It's a personal thing and you have to work at it. But I believe you can be both.

I would just say that moving ahead in management, for a woman, requires some thinking on your part as to how far you want to go and what skills you need to get there. You have to do some planning. I have a two year plan and a five year plan. I take a job. I do that job. I keep my plan for about two years and I have a five year plan. You have to understand what your strengths are and your weaknesses are. Then you have to figure out what are the skills you'll need to go to the next job. Now you lay down your game plan on, how I do what I have to do now and how do I build those skills to go to the next one. It's really not very difficult if you plan it. A lot of people around do not plan, men included. They think that macho is going to get them ahead. It doesn't work because brains start to play a part; organization starts to play a part; planning starts to play a part.

The next thing you need is sponsors. You need people to support you, to sell you, to help move you ahead. Now I established a reputation at one point in my career, had some believers, and they're mostly men, who believed that I could do a job and gave me an opportunity to do the next job. When I did the next job, I built more sponsors. You want to build sponsors with people that are going to move ahead in the business not someone that's going to stay behind. My sponsors happen to be president of the division right now and one of the group executives in the corporation. I have known them for seven years. So they've been sponsoring me every since then. Men have sponsors. That's not unique. If you're the executive or individual manager of the group, you hire people you know can do the job. If you have a company that says affirmative

action, you must look at females, and what are you doing in that area, that adds one more bonus. So if they know you, they know your capabilities, they're going to take you because their chances of success depend on you. Then you hope they move ahead so you do the job and you help them move ahead and that's how it works.

There's no magic to it, there's no one way. But you need support, you need visibility, you need planning, you need goals, you need skills and you need to broaden your skills. When you walk in the door, you're going to know one thing, and as you move ahead, you keep adding to those skills. The more skills you have, the more marketable you are. The more marketable you are the more options you have and then you just move ahead. But again I just want to say that without affirmative action it's very, very tough. So just make sure the company has an active program.

Thank you.

Problems Associated with the Employment of Professional Women:
A Female Perspective

It's really just tremendously rewarding for me to see this many women on the Tech campus. I just can't believe it. I got such pleasure this morning when President Pettit and Dean Valk were here and I said "O.K., walk to the front and see what it feels like to be an "O" or, if you haven't seen the film, "a minority". And, of course, they both laughed and Dean Valk even blushed, as he should. But I think now they begin to see what it's like to be a minority at Tech. I've been at Tech for so long and when I first came, as you heard from our biologist this morning, you didn't see women at Tech. If you did you'd say "there goes one". There were a lot of jokes made about co-eds. You know! Anybody who could come to Tech and learn that kind of material couldn't be very attractive. But all of that has disappeared. Now we have about 2,000 co-eds on campus who are very bright, who are doing well, who are also as attractive as anyone you would find anywhere and I am very proud of them.

When I was asked to speak on this panel, I selected this topic because I said, "there are some things I would like to say". Then when I tried to put it together I thought, "I don't know why in the world I ever selected that." But when you think about the problems for professional women in the work place or for women in the professions in the work place I think that's a little better. I thought: "What's so different?" "Why should we have a special thing about women in the professions?" "We have the same distribution of capability among women as we do among men." "So why should it be so special?" Well, all I had to do was look around me and see why it should be special. There are so few of us, so few women in high level positions. There are, if you read any statistics, increasingly large numbers of women in low level positions; in clerical positions if you're in business, at instructor or assistant professor levels if you're in academia, in the assistant to kind of categories. Well, I guess that's why we do it. Rarely, do you have women who carry the director type title and all the responsibility and authority that goes with it. But we're getting there.

There are two possibilities to simplify the situation as to why this might be true. One would suggest that perhaps it has to do with the structure of our organizations, perhaps they're so structured that women are inhibited or actually prevented from entering and moving up the ladder within an organization. That's entirely possible. Or, perhaps it could be that it has something to do with the structure of women. As a psychologist, I can talk about this. Perhaps the emotional qualities of women, perhaps the motivational level of women, perhaps the behaviors of women! Or it could be a combination of those.

Let's look at the structure of the system very quickly. Certainly, the system has inhibited women. It has prevented women from both entering, and once inside, from moving up. I can speak to that from personal experience. I have been in the business a long time and I know what it's like to have come along and have someone say, someone in authority, "why, of course you have all of the qualifications for that position, but this job requires a man" - with no further explanation than that. So now we have affirmative action and perhaps things will get turned around a little bit. And as you heard this morning, take advantage of it. It's here, make it work for you.

Now, in terms of personal characteristics, let's take a look at those. A lot of studies have been done in which people ascribe characteristics to males and characteristics to females and they come out quite different. Then when we look at the characteristics ascribed to leaders or to people in places of authority what do we find? We find a very high correlation between characteristics ascribed to men and characteristics ascribed to leaders. Well, some of these might be assertive, independent, self-confident, all of these kinds of characteristics. And females, what do we get? You could tell as well as I. Sensitive, dependent, nurturant, passive! These are characteristics that need not be negative but are all considered so when you're looking for people to put in positions of authority. The problem is that often times we assume that there is this bimodal distribution of characteristics, that all the assertive, strong characteristics count on one side and the males have them, that the more passive, the more dependent, the more sensitive characteristics are all on the other side and females have them. Not so! There is a distribution of characteristics. It just may be that women are a little freer to express some of the characteristics than are men. So the question is "are we really perceived that way", and the second one is "well, if we are, is it all that bad".

I think though that when we look at some of the personal structures of women one of the problems that I see that we have in terms of climbing that ladder whether it's in academia, whether it's in a science situation, whether it's in management or business, has to do with this little thing we call power. How it's acquired, what we do with it. A lot has been written on it and I will make no attempt to go into it or explain a lot of it. What I want to say are a few things about it. You talk about power as being the ability to get people to do what you want. It can be indirect power or it can be direct. For example, you think about direct as being very concrete power. That is, you have a lot of money. That's very concrete, it's very direct. Or you are very capable - you are the most knowledgeable in your field so you stand out a lot. That's direct power also. Or you might gain it by a particular position and that position gives you direct power over those under you. Now on the more indirect side, the personal power. How do we get that? Sometimes that depends on our being liked or our having the approval of other people. Women, of course, are very adept at using indirect power. We are aware that if people like us, particularly men, and they're the ones who are usually in the positions that we want, we're ascribing to, or the ones that hold the gateway somewhere we want to go; if they like us, then they might notice us and help move us forward. But we're looking at that primarily from their liking us, not primarily from whether or not we have the qualifications. Now, there's a difference there, we can have both and sometimes you have to use that liking in order to be able to express the qualifications that you have. I think you're all aware of how this might help us sometimes.

The problem, as I see it though, is that many women who are quite capable and who have no need as I see it for the use of indirect power still seem to rely more on direct power, gaining and expressing their own capabilities. Why? It's very difficult I think for many women to compete directly with men because we want them to love us, they're the people we're going to live with and we find it quite difficult to be competing and yet gaining their approval. Now, men have some similar kinds of problems and I'm sure Mike will talk about some of those later on. We're use to competing with women. Unfortunately, too much so sometimes. Because, as we were growing up, we were always competing with another woman for a man's approval it seems -- whether it was your father or boyfriend later on. So we can compete with women, but when we put women in direct competition with men, then we begin to feel some sense of insecurity and we women will tend often times to take a round about way to get where we want to go to try to manipulate the person who is above us by using feminine wiles rather than

the direct approach. Sometimes it works a lot better, but I think when you do that you have to know what you're doing, you have to realize that you may be playing for a very short term gain.

The feeling that I have is that women must support other women. Now that doesn't mean just support other women regardless of qualifications. Somehow we have to learn that not only can we compete directly with women, we can compete with men. But we can support other women who are in a competitive situation, if they're qualified. Along this line, I came across this quote. It says, this is some advice to women who are trying to make it to management. Ask a man's opinion about your ideas, then show gratitude for his help. Make your points as questions then you may be accepted. Even the most insecure type of male will not resent your achievements if you don't flaunt them. Okay, I think there's a little message in there for us. Another little bit of wisdom that we've all heard and we heard here expressed a little bit this morning is the perception of women again and that is that behind every successful man there is a woman. Great. That's fine but does she have to be behind him. I never have been able to accept that one although I've been in that position and I know exactly what that's like.

We do have some special characteristics. You heard some of them expressed today when we heard the attorney talking about "I like to help people". That's a nurturant need, a need to help. She found how to make that need work for her. It provided the motivation to get her through law school and she says "now I'm enjoying what I do". "I can go home at night and know that I have helped somebody." And she's obviously very successful in that. Her husband apparently shares that kind of feeling and they have what appears to be an ideal relationship. So the feelings that we as women have need not be negative. They can be positive but we have to find ways to make them work for us.

Another thing I've noticed about women and that is that they tend not to be willing often times to take the risk, and if you don't take a risk, you're not going to get anywhere. Nancy knows very well that when she started out in her own business she was taking a risk, even though she had grant money and she'd had success here at Tech. Okay, but she was starting on a new venture and it was a risk. She took it, she's made good on it and she's continuing to make good on it. We have to be able to do that. Now that risk might just be in asserting yourself. It might just be in expressing an unpopular opinion and that's not very difficult to find situations in which you can express an unpopular opinion. It might be that you have to stand up or say something good about a woman. It might be that you have to stand up and say that you don't like some of the things that are being said about women or jokes that are being made sometimes. You have to do that every now and then. I think it would be very unfortunate if we couldn't laugh at a very funny thing. But there's a fine line there between accepting that which might be not acceptable if it were said about some other group than women. I would think on that a little bit.

I heard something else this morning that I thought was very good and I want to just remind you of that. One of the speakers said, know what your capabilities are, know what you like and what you don't like, two very important things. Don't let yourself get in a position that you can't handle. Now, I say that and then I come right back and say this which sounds like I'm flipping on both sides of the fence. If you get yourself in a position for which you are not qualified, you cannot handle it, it not only is going to hurt you, it's going to hurt other women because there are so few of us. And everybody focuses on the woman in the position. If Gloria messes up as president of a college, they're going

to say, "See I told you a woman couldn't do it." A woman. How many men fail at being presidents of colleges? Or how many men do any number of things. It doesn't matter. We have a woman in Georgia who's now president of a college and eyes are focused on her. That's what I mean. Now, the other side of that is, don't be afraid to try something that you're not sure you have the qualifications to do. You have to push yourself a little bit. Women often times tend to back off and say I'll take one more course and then I'll do it. I know these things, I've done them all. I know exactly what it's like. So the point is to know what your capabilities are, to get some assessment of those, to know what you like and don't like, then reach as high as you can. Stretch yourself.

Let me read one thing, if I haven't lost it, that is not new. I am sure you've heard it before but I think it's very appropriate for this. "Here's how to tell a businessman from a businesswoman." A businessman is aggressive, a businesswoman is pushy. He is careful about detail, she's picky. He loses his temper because he's so involved in his job, she's bitchy. He's depressed or hung over so everyone tiptoes past his office, she's moody so it must be her time of the month. He follows through, she doesn't know when to quit. He's firm, she's stubborn. He makes wise judgements, she reveals her prejudices. He's a man of the world, she's been around. He isn't afraid to say what he thinks, she's tyrannical. He'd discreet, she's secretive. He's a stern task master, she's difficult to work for.

Mike Donahue

Problems Associated with the Employment of Professional Women: A Male Perspective

Dick White, my good friend, and I are to give the male perspective of problems that women may encounter in business and industry in career employment. I'm not quite sure how we agreed to do this. Dick accuses me of having a six pack before I told Sherrill that we would do it. That's not the case because I think we decided about 10:00 one morning. But anyhow, that's our topic, to give you a little bit of male perspective. What I'd like to talk about is our property in the north Georgia mountains and my killing a rattle snake up there. But we have to divide the topic. See, we only get 15 minutes. I've only got about six minutes so I've got to come forth with a number of items in about six minutes. Basically, what Dick and I decided we would do is talk about problems during employment, male perspective; divide it up with me taking the problems that we might see or think that we see during the employment search process, then Dick will spend some time talking about problems, real or preceived, during employment or during the career. So I'm basically going to keep my remarks to the employment search.

My remarks are basically from observation, from talking with interviewers, primarily interviewers from large corporations that recruit on college campuses, that interview professional people or potential professional people. It's going to be very difficult to generalize because really there's a lot of differences, I think. When you're talking about bachelors' level people versus Ph.D.s, I think there's a lot of differences with respect to the career goals. As to whether you're talking about seeking a 30 year career in a very technical area doing research versus wanting to be a "manager", I think the settings have a lot to do with it. Settings are the environment, meaning academic positions versus government positions versus being a professional person, i.e. attorney, physician, etc. versus business and industry. I'm primarily going to be talking about graduates who interview for positions in business and industry. I think many times what happens when people are interviewing is they lose sight of what companies are looking for.

In many cases and in large numbers basically employers are looking for potential managers. And when they are looking for potential managers, academic performance is very important but there are a number of other factors that are just as important, for example, leadership skills and communication skills. There is no doubt about the very high academic performance of women students in engineering and science. If I am hearing employers meaning their interviewers correctly, they do have a concern. Problem, not necessarily a problem, but a concern that many women students are spending so much time in terms of academic performance that they are sacrificing some other skill building activities, i.e. involvement in professional groups, student government, etc., where they can sharpen, hone communication skills and leadership skills. Again, the concept being potential manager. They have expressed this to me basically and Dick's going to say the same thing. What we're trying to do is report to you what we think we are hearing from males who do a lot of interviewing. Dick is going to do a different approach in terms of some studies that have been done, and will basically report information to you.

Many of the interviewers feel that women who are on the job market and interviewing for positions have some false or unrealistic expectations. Due to affirmative action, etc., some women evidently, our employer friends are saying a number of women, a significant number, are under or have the expectation that being female is going to get you the job. In science and engineering areas, this well could be a myth because the numbers of degrees already granted and being granted to women engineers and scientists is getting to the point where some employers under tremendous pressure needing females in their work force will hire women. Uh, uh, not so much now. We can even observe at Tech that, as recently as a few years ago, where a number of say women engineering students were in high demand but quite frankly, in terms of qualifications, as measured by grade point average or involvement in student groups and on down the line...probably were not as qualified in getting jobs. And, now, uh, uh, a number of women students do have problems in finding employment because employers are evaluating the total package.

I think perhaps another mistake or false expectation is that many women students assume that interviewers are experts in interviewing and have a great deal of knowledge of their companies and organizations. Now my associate director is here from the placement center and as she well knows, we get really a bunch of turkeys on the Campus in terms of interviewers that really don't know what in the world is going on. They don't know how to conduct a good interview, they really do not know how to evaluate people and ask inappropriate, if not illegal, questions. Some people assume the interviewer has the total responsibility for the interview and I guess what I am basically saying is uh, uh. This is where women do have to assert themselves. The interview is a two-way street. What employers will report is many times women will not assume that role. They'll fall into the trap by having preconceived ideas of what that interviewer is to do, let them dictate, run the interview and consequently are not able to forward their credentials, qualifications, explain their career interest, etc. You do have to take an active role in it. However, on the other hand, you have to be a little bit careful because many times you do need to be assertive forwarding your rights with respect to the rights of others. But you do not want to be aggressive forwarding your rights without respect for the rights of others. You don't want to be aggressive because probably chances are you will threaten the hell out of the interviewer and consequently they are going to reject you. Or, they know that with that kind of behavior you will threaten hiring managers to the extent that they will not even take a look at you. But you do have to be assertive.

There is another phenomenon that is taking place and I guess you can call it false expectations, very similarly to what went on with MBAs a few years back. What I am concerned about is expectations concerning the job. With the tremendous need over the years for women engineers, women scientists, firms have really gone in the direction of hiring a lot of women students for summer employment. What do they do? They roll out the red carpet. So many times what is happening is that they are providing women students with jobs where they have one project, one supervisor, plenty of backup support. Companies are very PR oriented. They know when this student goes back to the campus, words are going to be great on the campus. Gee! I had such a fantastic summer job. Gee! I did this and all this kind of thing. But, when you start looking for a job on a permanent basis in the real world that ain't the real world. What you usually find is that you have eight projects, can never find your supervisor or you have eight different supervisors for the eight different projects. We receive many phone calls from women students with just that kind of a frustration. It is because they have been given certain kind of positions, setting the expectations and then when they get into the permanent business, uh, uh, that is not the case.

The biggest thing I hear from interviewers is the biggest problem they're still having today or thing they're wrestling with today is dual career families and when you get into relocation, etc. That is the big thing that is in the back of their mind. You really have to think through that concept, where you stand on some of the issues that are involved there.

Another thing I have to say is a personal concern but I think also shared by interviewers and I am not quite sure how to say this either, so I'll just spit it out. Many interviewers are very concerned about women's sensitivity to EEO considerations and where the concern then comes in is that they feel that, because women have been so sensitized to EEO considerations, they, the interviewers, will really have to be on their guard. What we are concerned about is whether they will conduct a good interview. They start getting so hung up on what questions they can ask, what kinds of comments they can make to a female applicant that, I think, many times they withhold information, or they will not ask for information that would really assist them, not only in making a decision as to whether you are a qualified applicant, but provide you with the appropriate information for you to decide whether you want to go further with that company and even consider employment.

Now, granted there are some things that you should take them to task for. You know when they ask you what kind of contraceptive methods you are using, you should take them to task. But a concern we have in the placement center is that we'll find many of our students are reacting to questions like what is your marital status and wanting to take a company to task on that kind of a thing. Hey, wait a minute, I am not sure that is the thing you should be taking them to task on. How do you feel if you've got a blob of grease on your blouse? Yeah, I'd raise a little Cain about that but many times in the interview you have to be heads up because the interviewer will say "hey do you know that this position is going to be in a hot, dirty, grimy, sweaty place...are you still interested"? Many women will interpret that, or students anyway, as discriminatory in nature. They say that to all the male candidates also because the job happens to be a very hot, dirty, sweaty, grimy, situation. That's why I say heads up...anyway that is a few things for you to think about in terms of the employment process.

Dick White

Problems Associated with the Employment of Professional Women:
A Male Perspective

I want to thank you, Mike, for setting me up. I'm going to be interviewing next week and I'd really appreciate it if none of you would walk in and slap me. The subject I want to touch on briefly today I think you will probably find, some of you will agree with me, some of you won't, has a degree of controversy. I have to set the stage first. I had hoped there would be someone in the back of the room so that you could check your tomatoes and pop bottles, just in case you find it too controversial. At Dow-Chemical, we felt a real need recently because the number of females in our work force in all the disciplines is growing dramatically. We felt that it was time to go back to our managers and managers of other companies and ask them what are some of the real world situations that you find in dealing with a male supervisor/female subordinate role. We started with about 100 candidates. We ended up doing some fairly extensive interviewing of about 40 of these gentlemen and from that we tried to take some real world situations. Now, you are going to have to bear with me. As I said, some of them you are going to buy, some of them you are not going to buy, some of them you are going to get mad at me about...maybe not. At least I want you to know that my objective today is to maybe improve your awareness of some of the things - right or wrong - that male managers out there in the real world think and, hopefully, give you some insight on how you can impact this. So, please bear with me, this is not Dow Chemical Company policy, I promise. We've decided, in front of this group, to let our hair down a little bit and let you have some insight into a fairly confidential kind of interview we had. By the way, we are doing another survey, just getting underway with that, and it is going to be the impact of the female superior and male subordinate. So maybe in a year we will have some data that you would be interested in seeing on those. Those situations certainly are growing also.

A male perspective, let me just get going. We took a lot of data and we narrowed it down to certain areas. I will run through them just as quickly as I can. Don't throw anything at me. We looked first of all at emotional issues. We hear a lot about them...I think it is overplayed. We found that some of the managers in our survey thought that the typical female employee is much easier to intimidate, especially with the word "no". I can't think of anybody that said that was a negative necessarily, but that there was a lot of work being done to balance the assertive and aggressive approach. The managers in this particular survey felt that the people they work with, the typical female, was not probably aggressive enough and could be intimidated.

There was a feeling that the typical female - and I don't like that term - typical female, because there is no such thing I have learned. But, the females, at least that they are working with, tend to have more emotional peaks and valleys and needed more reinforcement counseling. Again, there are managers that think that. We are not advocating that, I don't necessarily agree with that. One thing that did come to light through the survey though was that there was a definite lack of role models for a lot of the jobs you females are aspiring to. Maybe in that context when properly handled counseling and more reinforcement from your immediate supervisor is appropriate.

One thing that came through most often was an emotional point of view which I thought was extremely interesting, having a daughter who is a freshman in college. They found that females were more open and honest than their male counterparts in almost every aspect of the way they approach their job. I don't imply that my daughter is not, but she has a nice way of making things come out in her favor sometimes.

Another section we looked at were fears and attitudes. Unequivocally, the female employee today is not one to hear "you are doing a good job for a woman". I thoroughly agree with that because they certainly want to be considered a part of the entire working force. We found in the people we talked to that some of the females working for them tended to spend a lot of time worrying about "am I getting the top research project, am I getting that promotion, am I getting that production assignment because I earned it or because I'm a woman"? I think there is hopefully a point there for you to ponder. From my management experience, I am starting to editorialize, forgive me. The thing you should concentrate on is doing the best job you possibly can. That is going to be the bottom line throughout all of this.

In the survey we discovered a daughter or niece syndrome. Male managers like to become father images I suppose to their female subordinates. That's garbage and we felt, at least in the survey, the data came back that many of our managers were not aware of that. We are here to be managers, certainly each female does not need a father image but wants to take their lumps just as everybody else in the work force. How am I doing? Remember, I am a reporter here today.

Another issue that came up that I thought was quite interesting. Most respondents in this study had discovered, and one of the things we discovered as we looked at the data, an area that I call a home sponsor. Many of the managers hadn't really thought of and it has become very apparent to them that a female in business today or in a science area, in a married situation, is considered a loner. One comment came back in a survey and I will never forget it. You know, a gentleman said, a female cannot have a wife. In a conventional sense, I had never thought of it that way but I absolutely agree with that. In the conventional sense and in business or science, wherever you happen to be working, you have got to remember that potentially a manager could look at you because you may not have the same kind of support from your spouse that you are giving your spouse in a dual situation. Lack of the home sponsor equating to a loner, that may be a problem you may want to be aware of.

Along the same lines, there was no doubt about this, the female in a dual-income family may get support from the male, but probably that has got to be God. Maybe if she is up there, she will turn the light back on. The female may get support but it will probably be a different type of support from a spouse. The thing we found is that the male is expecting the female support. That sometimes can sure muddy the water. Also we found that several of the managers in this report tended to think of the female in the work force as a second source of income. It really didn't matter whether you were the primary source, you were a dual-income family or you were a secondary source. Absolutely, the kind of thing we hope in this area is that you can improve your awareness or increase your awareness, because some managers do tend to think that way.

I had some others, security, female-female relationships and some others. If we have time later, I will be happy to counsel with you. Before I leave you, again, I want to leave you with the fact that I hope some of these things will make you aware and make you more comfortable as you get into the work force and thank you very much.

Gloria Shatto

Balancing Career and Family

Before talking about my assigned topic, I think I will comment on something Jo said and that is the feeling that all of us have before taking a job that maybe we should go back and take some courses. I confess that after I took the Presidency of Berry College, I realized that I could spend another 30 years in school. Now, it's not running a college that is so difficult, that's probably like any management job in higher education. It's a four-year college with masters degrees. But there is also an academy there with a middle school and a high school, part of which is boarding. There is also an early learning center. Also, there are 27,000 acres up there owned by that college. That means about 24,000 acres or how many more courses in forestry management one might take. I grew up in the City. There are 1,000 head of beef cattle. I'm used to canned meat. There's a dairy that makes a profit. I do understand that, it's the bottom line. Anyway if you have the feeling of wanting to go back - oh we have a quarry too. I had never seen a quarry before. We lease it. We own a bank building and lease it. I've been in a bank though. But, anyway, if you have those feelings about needing to take another course, at some point you have to say "OK, I've had a long background in a related area and now I'm going to learn on the job for a while, while I use those talents I have. From time to time, we do need to go back and learn more. But, again, that's a do-it-yourself project and it's amazing how you can do it on the job. Terror is a good incentive.

Now my topic is balancing career and family. It would be presumptuous of me to tell you that I have the answers on how to do that. Yet being an economist gives me some advantage. We speak often on problems that appear to have no answers. We seldom agree with each other on just what the problem is and just what the solution is. Nevertheless, with that kind of warning, I will try to discuss some of the dimensions of this balancing act.

The degree of difficulty really depends, I think, on how many people are involved. For example, as a single young woman, you are graduated and begin your first job. Your working hours become more regularized than your college-life hours. Your life-style often improves. For one thing, your income shows a remarkable increase.. Most of us are able to adapt to rising incomes. In college you learn to manage your time efficiently, and that remains a useful talent as you allocate free time among recreation, community service, religious activities, personal growth and development and then, of course, time for your family and friends. You place priorities and budget your time so that you do have time left over for family and friends.

Let us complicate the process a little bit more. For those who are married, the balancing of work and home is really not that much more complicated though. Your plans then involve coordinating with one other person, your spouse. But certainly modern home appliances have made many of the home responsibilities much easier for women and for men and modern couples tend to share the tasks around the home and still have spare time. The important dimension, I believe of that balancing act is the inter-personal relationships, being sure, or really the need for effective open communication.

The part of the balancing act that becomes difficult, at least I think it becomes far more complicated, is when children are involved. The modern woman finds that she can hold a variety of jobs during her lifetime. At different stages of your life, you discover that you can find different jobs that suit your needs and the needs of your family. Many young women work part-time or even drop out of their career during the period when they have young children, I don't think that necessarily has to be a rule...in fact, I am sure that it doesn't necessarily have to be a rule. But that decision is a personal one. It has to be decided by each person, by each family. Certainly, many women successfully maintain careers with young children in the home. The important thing in our relationships is not the quantity of time you spend with your children or your husband but the quality of that time. As long as there is good child-care, the working mother can be productive in her career.

A good home relationship plus flexibility on the part of both parents, certainly helps in this satisfactory work and home combination. Things have changed. Sometimes if you talk to older people they tell you all the problems. Modern technology certainly makes it a different world from that of even your parents. I can recall in the early years of my marriage, something simple like clothes had to be laundered and ironed or sent to the cleaners. Today, many young people don't even own irons because of modern fabrics not because they're sloppy. But, modern appliances, modern technology, science, that is your field, certainly means that you have some time to choose alternative activities...careers, community service, time for family and recreation. Also modern medical achievements give additional freedom to women, permit choices about family size and the timing of the birth of children. I am almost embarrassed to have said that since my children are 9 1/2 months apart in age. That's okay. One is adopted and one is the old-fashioned way. Still I think that is a generally true statement. Modern science, medical achievements certainly make it easier for you. Again, talk with older persons. They tell you about all the time you might spend with children who are ill, children who have diphtheria, measles...all these things that don't even happen anymore. As a young mother, you'll spend your time on nutrition and proper health habits with your children. Modern wonder drugs make raising children much less hectic.

I think that the modern working mother has different priorities for her time than the non-working mother. Working mothers do not have time for the soaps and working mothers often forego personal recreation, hobbies and so on. You have a different relationship with your children. I can recall when my children were in elementary school they really thought they were disadvantaged children because I could never attend their school parties on Valentine's day, Christmas and so on. But, after a lot of explanation they began to understand that there were disadvantages at some stages of their lives...they hoped maybe that this would be offset by advantages later. We should try to convince them that it is. I think this whole project of balancing work and home is a do-it-

yourself project. There simply are no right or wrong answers. There is no pat answer to fit every family. It is a decision that you as an individual have to make, one that your family has to make. It certainly takes cooperation and patience. I will be glad to discuss that or other topics later.

Margaret Mermin

Career Breaks or Beginning Past 30

I was asked to speak on career breaks or beginning your career late and I think that's because I started mine when I was 31 or, at least, my most recent career. I didn't look very far ahead when I graduated from college and worked for a couple of years at a sort of ordinary job, had children and chose to stay home with them and enjoyed that very much, until the second one was three. Then I suddenly looked up and said "oh my goodness, I've made a terrible mistake". "This is not a lifetime job." I had no preparation at all to do anything else that was of interest to me. I had a degree in Psychology, but I didn't particularly want to do anything with that. I had almost a dual major in Biology and I spent about three years well two years, having an identity crisis at the ripe age of 29. I felt sort of foolish doing that at that age but it was the first time it had occurred to me that I might even need to think about that. So when I was 31, I woke up one morning, having muddled through many things and decided what I really wanted to do was to go to medical school. I applied but was turned down by many because of my age and by others because of my grade point average ten years before. It didn't look very good any more because grades had inflated in those ten years. In some ways, my story, I think, is typical of what anyone goes through who has had a long break between schooling and deciding what to do next. However, Emory, which I had always thought of as very conservative (I had been there as an undergraduate) did accept me. I was the second women with children they had ever accepted.

I loved medical school. I think it is a great advantage in some ways to go back to school when you are ready and you know what you want to do and after you have had a break. Because other people had been in school their whole lives since they were four years old, or three most of them, they were getting sort of bored whereas I was just thrilled. I was so delighted someone had accepted me that I was willing to work all those hours which for someone else were just a grind. I am now 39 and I just finished a residency in internal medicine. I think that it really doesn't matter what age you come to when you find out what you really want to do with your life, it's just great.

I think what you need is a lot of support if you're going to have a career break, if you're going to try to break back into a field. We heard this morning about all the women who made careful plans early on and went up the ladder. When you are out for a while you have obviously missed some of the steps on the ladder and you need a lot of support if you're going to get back on. What I did was to pick a field where you don't have a boss... where you can be your own boss. That helps some. You don't have to get back on any kind of corporate ladder. Support came from other women who had done similar things. I had a hard time finding those people, but I think it is getting increasingly easier. And for me, from my family but not every woman has that. I was fortunate to have a very understanding husband. Let's see, I guess I had been married about 10 years when I decided to do this and my husband just said "great" and was very supportive of me. I know other women, however, who did it who were widowed or who were divorced or who in the process found that their husbands initially felt

it was great and as they became more successful or less interested in him, because their time was taken up in other ways, found that he couldn't stand that or they just grew apart because they spent very little time together. For those people I would say that if you're going to make a big change in your career, I think it is important that you keep some kind of a support system intact. For me, it was mostly family but for a lot of people it needs to be friends. That comes into play if you're deciding where you're going to go to school or where you're going to take a new job. You might want to consider being where you have some friends or some family or someone who will be able to help you when things get rough.

What are the difficulties of going back to school when you're 31? One was that I had never developed any study habits. I had no career goals when I was in college and I had managed to get through by cramming the night before exams. Well, that won't do in medical school or in law school or in any of the things we're talking about. I had for the first time to really learn to sit down and read a book for eight hours or whatever I needed to do to get through. That took about six months. I failed one exam, for the first time in my entire life, but I ended up doing very well in school and again I think partly it was just because I wanted to do it so much.

The other thing is if you have a family, that obviously takes a great deal of time. I never was sure whether I envied the men in my class who had wives who did all of that for them and they had no responsibilities. I thought that was rather sad that they didn't, because I expected to continue to be a mother. I continued to get a great deal out of my relationship with my children whereas I think they missed a great deal of that. And that's changing. I think you will find more men, and I hope some of you will be able to marry some of them, who want to take part in raising their children. I think Marsha King's arrangement this morning is more typical of what's happening now. For me, my husband agreed and it turned out to be very good. I had stayed home and kept the homefires burning while he developed his career then he felt that it wasn't fair, he didn't stay home, but to do more of the home stuff while I was developing my career. So if a child got sick, he left work and picked the kid up from school and took him to the doctor. I was never bothered with things like that. That was very fortunate that he was willing to do that.

The other thing which is difficult is other people's attitudes. Some people just don't understand why you waited so long. I just got tired of having people ask me "Does your husband let you do this?". "What do your children think?" "And why did you wait so long?" But, again, you just find people who won't ask you all those questions but who will just support you so the ones who do you can just ignore.

I have some other stories from other people because there is more than one way to do it. For me, I decided even though it was so late to do the whole long thing. I was seven years in training and that's minimal. If you go into medicine, it's at least seven years and more often eight or nine or ten counting school and all the residencies you'll have to do. I have one friend who graduated from Emory the same year I did, went back to graduate school and decided she didn't like it. By that time, she was thirty-three and decided that she just wasn't willing to do it to go to medical school. She's a P.A. Do you know what that is? A physician's associate. In a way that seems like settling for less and it certainly is. They have two years of training where we have seven. But for her she feels like she'll be able to do work she'll like and not have to make that enormous investment, so there are other ways if you decide later you have to make some adjustments in your career goals.

I have another friend who went straight out of school into medical school and was very successful and had a baby just before she started her internship. She eventually decided to stop her training, raise children two or three years, essentially she did the same thing I did but in a different order, and then go back. And then I know another woman who was an intern when she had her baby. She was an ObGyn intern. She was delivering babies up to about two days before she had her own child. She went back six weeks later and never stopped her training, loved the whole thing and just did fine. So it's really a matter of personal style and how much you like to work, going back to school. Here I am. I survived. I just got a few grey hairs.

Toby Block

Alternate Lifestyles, Commuting Marriages

We've been hearing a lot today about factors that affect women's perceptions of themselves and their success rate in science. I would like to comment on what Margaret said about what people say to you. I've always felt that I'm a very other directed person and I think many women do find that they are strongly affected by how people react to them. I really think this is one of the strong factors in influencing men and women who go into science. If you meet a boy who is in high school or college and he says that he is going to be a doctor or a scientist, people usually say "oh, that is very nice". And maybe if they know something about the area they say "Oh, what field do you want to go into" or "what school do you think you're going to"? But, if you are a girl in high school or college, and you say that you are going to become a chemist, as I used to say, people say "well what you are going to do when you get married?" As a result you spend a lot of your time thinking of what you will do when you get married rather than thinking about what field you are going to go into and whether you are going to like this kind of work, etc. So to help some of you who are following, I would like to tell you the story of what happened when I got married. I did not drop out of science so I hope that you will find that as an upbeat note for your own plans.

I was introduced to my husband when he was still back home. We are both from New York. He was in graduate school in New York, and I was in graduate school in Madison, Wisconsin. We were both fairly far along in our graduate studies and the question of one of us quitting and going to join the other one, presumably my going back to New York really never came up. We just assumed that Jerry would finish first, since he was a little bit older than I was, and that somehow he would then come out to Madison, Wisconsin. So our courtship consisted of the first two years being mostly telephone calls and letters between Wisconsin and New York and visits during school vacations.

When he finally finished his degree he got a post-doctoral appointment in Madison. That was in the summer of 1975. I finished my degree in the summer of 1976. So now he had gotten himself out to Wisconsin and his job was supposed to run for another couple of years. We had not decided yet that we wanted to get married and there was no way that I could get a job in Madison, so we were faced with this dilemma. You can't quit work. From my point of view, I couldn't quit work to get married. But certainly you can't quit work because there is somebody around whom you think you might marry. So, I started to look for jobs in the area. I must say the fact that he was in Madison was something I considered. I wasn't going to do nothing while he was in Madison. So, I got a job in Stevens Point, Wisconsin, where there is a four-year college

which is a branch of the University of Wisconsin. And, this worked out to be the ideal job for me. I had always wanted to teach in a four-year college...I am not interested in doing chemical research...I am more interested in chemical education. It turned out that the department up there was just super. One of the other physical chemists had worked for my major professor in Madison so he sort of took me under his wing. As far as the job was concerned, that was perfect.

What were the problems? Well, Jerry was down in Madison and that was 110 miles away. But that wasn't the only problem up there. It's a very small town, 22,000 people. I'm from New York. I still consider Madison to be rather provincial. There was an additional complication, that I am an observant Jew and there was no Jewish community there. But, you regard it as a temporary situation and you keep looking for jobs. So we were apart, again courting for another year or so. We got married. Jerry is still in Madison, I'm still in Stevens Point and we are both looking for jobs. Now, I don't know how many of you happen to be chemists, but the job market in chemistry is not that good at the moment. There are jobs but the pickier you are, the harder it is to find. If you are going to start saying that you want two jobs in one place, you want to be in a big city, you want to be in a decent climate, in Stevens Point, it would be -40° for a month at the time, you want a Jewish community, you are not going to find it.

The first three years that I was at Point, I kept looking for jobs. Most places that turned me down, turned me down because I wasn't doing any research. Jerry, conversely, wanted to break into teaching, but all that he had done was his graduate research and post-doctoral research. So when he applied for teaching jobs, he was told that he had never taught. Okay!

Last year, Jerry finally got his chance to teach at Southern Illinois University, in Carbondale, Illinois. That's at the very tip of the State. Wisconsin sits above Illinois. Point is in the center of Wisconsin. We were now 550 miles apart. People used to say to us "isn't this kind of wierd!" And, to tell them that it's not so wierd we used to tell the story about how we managed to spend the last Jewish New Year together. I had gone down to Madison. Jerry came up from Carbondale to Madison. We stayed in the house of a friend. We had the full use of the house because our friend had gone from Madison to visit his wife in Maryland. So, we weren't the only crazy ones. And, I've met several other couples who have done this. One woman, who is a sociologist in Madison, has been commuting between Madison and Michigan for nine of the eleven years that she has been married. Everybody always says it is temporary. Nobody would ever say well alright this is what we want to do and, of course, that is one of the problems with commuting. If you get married, you do have this idea that you will live together. You do want to be with your spouse, so you always say that it is a temporary situation. But, if you are willing to accept it, for what it is worth, it does have certain advantages. Certainly, in terms of our careers, I had my chance to be an assistant professor in exactly the kind of department I wanted to be in. I wasn't kept out of that because I wanted to be with Jerry. Jerry had his chance to get his teaching experience. It turned out that because we lived in student-type housing near the campus in both cases that we were still coming out ahead financially, although we were maintaining two apartments.

But certainly one of the disadvantages of commuting is financial. You are running two separate households. In terms of your visiting, you either spend a lot of time travelling by car or train, or you spend a lot of money visiting by phone or flying. So, certainly, that is one of the problems of commuting. There are some other disadvantages. One is that you don't really fit into the social scene. You can't really go out to singles type things, because you are not looking to meet anybody. But you also don't fit into a couples situation if your spouse isn't around. The academic calendar does make commuting a little less onerous, because a year is really only nine months, and you have frequent breaks. You have your long Christmas break and Thanksgiving and Spring break and things like that. So, we found that we were able to get together often enough. Most of the people we know that commute either don't have children or started their separation when their children were older. For instance, one man that I met had taught at Parson's College which closed, when his children were about 15 years old. He found a job in a town to which the family did not want to move, so he had been commuting back and forth from his job to his home. If you have really little children, Mark is 31 days old, of course, we felt that if we were going to have children, we wanted to be together when they were small because otherwise the person who has the child has all of the burden of raising the child, but also all of the joy of raising the child. So it really works out best if the children are either not there or are older.

I must tell you that when I interviewed for my job here at Tech and I just started working at Tech, I didn't know that I was pregnant. By the time they offered me the job, I did know and I told them that I was pregnant and they said that that was just fine. I started to work July 1. I worked until August 29, which was a Friday. Mark was born on a Sunday, the 31st, and I anticipate coming back to work in about two weeks. So, having a child is not necessarily something that is going to stop you from working. I think as was said before that is an option you might want to consider. I don't think we should be overly intimidated by this question of, what are you going to do if your husband is transferred or if you have a child. There are now more various things that people are doing and it can be helpful if you are asked such questions, to be able to respond. "Other people have done this before." There are still places, however, that will lose interest in you. During my time of interviewing, when I was trying to leave Steven's Point, there was one school which was very interested in me which lost interest completely when they found out that I was married. And, in this day and age, when there are other places that you can turn to, I think that perhaps you are still well off saying, "I don't need to have any hassle from you". "If you are going to object to the fact that I am married or have a child, then, I would just rather not work for you." I am glad to say that we are now in a situation where there are more schools where we can do this sort of thing.

The main thing I would like to tell you about is commuting, once again. I don't think anybody would ever say well this is how we are going to plan a marriage. We are going to plan that he will live in California and I will live in New York and we will see each other once a year. But, the fact that some people have done it over a very long term and have built strong marriages, I think should be encouraging to you in the event that you find "okay I am married, maybe I have a fairly traditional marriage, but this summer I would like to go and participate in a course in the next State". Your husband will be able to learn how to cook for himself. He will be able to learn how to maintain the house in a manner that is acceptable to him. This is universal. I understand that no husband does the dishes the way the wife wants him to do the dishes. They are really very resourceful people and we should put a stop to coddling them and thinking that, well, you know, "I can't go away, who is going to take care of him?" He will find out how to take care of himself.

THE FOLLOWING IS A LIST OF RESPONSES TO QUESTION #9 ON THE QUESTIONNAIRE:

QUESTION #9: IN RETROSPECT, WAS ANYTHING NOT INCLUDED IN THE WORKSHOP WHICH YOU FEEL WOULD HAVE BEEN PARTICULARLY VALUABLE?

No, but the one comment for improvement I heard most frequently was that most of the "successful" employers who spoke were transplanted Yankees - indicates a need for more truly Southern prospective employers. Note: Most useful information was that on what questions could logically be expected from prospective employers.

More specific information with examples on resumes, cover letters, and interview techniques (other than the video tape that was shown). A job fair with companies "ready and looking for someone to hire."

I would like to see more included for the woman who has been out of the workforce for a number of years. I felt the workshop was geared to women just graduating or already working - with a ten year old degree and six years of staying home with my children, I am looking for help in deciding what options are open to me now.

I felt that in addition to the emphasis on the field of management, I would have liked more emphasis on science. For example, not only marketing a product, but doing pure and simple scientific research, or having a career in academia (say a professor at Georgia Tech).

The opportunity to chat with company representatives "launched" me on my career search. September was not too early to start ... too many folks I know have waited to the last minute.

Include in any future workshop high school senior and junior girls.

I thought the workshop was excellent and would encourage other women to attend future workshops. The only problem was the usual can-only-be-one-place-at-one-time of all workshops with many interesting sessions.

For a one day workshop I think everything there was time for was there. In a larger workshop, I would like more discussion with different professionals and other participants, to understand other's experiences better. It's great there will be more workshops next year. I hope the quality of the speakers will remain as high. Best wishes!

It would have been nice to have had a newsletter developed with job opportunities in science fields for the workshop. Including more women in different levels of management in science fields available for insight and direct discussions would have been advantageous. More attention to the needs of women planning career changes to utilize science degrees where the women have been underemployed or employed outside their area of interest was needed.

No. I found the informal chats very helpful. Also, the visit to the career fair was informative.

Yes. Follow up of career information and counseling on an individual level.

Yes, I think you should include information about the "follow-up letter" and the "cover letter". At Emory we have a format to go by which has been particularly helpful.

Job opportunities at the Bachelor degree level in science; possible directions a science career could take.

I thought the workshop was very informative. However, since then, I have decided to get out of the science field entirely. I thought the workshop was geared more for college graduates and could have more to offer women who have been out of college for some time and want to get into the job force for the first time or want to change jobs within the science field.

No.

I think it would have been helpful if someone had addressed the question "Why Go to Graduate School in a Pure Science."

Perhaps a session on identifying marketable skills, and how to present yourself in an interview. Maybe supply participants with a list of local contacts to use in networking.

I feel there should have been more emphasis on biological fields. I have a B.S. degree in Biology and I found very little at the workshop which dealt with getting a job in this field.

More time to talk to employers that were on campus that day.

More for the younger professional just beginning her career.

I think more professionals in SPECIFIC fields of Engineering.

No.

Too many people graduate from school and get a job without knowing what that job is about. Advice was given to the effect that in job interviews you should know what position you're applying for. However, for a new grad that position is usually just a title grabbed from a company report. That grad has no idea of the job that that title applies to. I would like to see some advice given on how to decide what job to apply for, and how to tell what the job actually offers.

More of a separation of career counseling and coping skills for those of us dealing with male dominated work situations. A section in legal rights of employees and employers in regards to sexual discrimination.

Not that I can think of.

There might have been more information about grad schools other than law or medical school, and there might have been more information about academic careers. I want to teach physiology on a college level, so a lot of material was interesting to me only because it involved working women in general or industry work in general (my husband is in chemical engineering). I could not learn about women in my specific career.

No.

I think it would be entirely appropriate to have a workshop (or a section of a workshop) address the situation described below and even perhaps serve as a place for "creative thinking" as far as solutions to the problem may be

ANSWERS TO QUESTION #9 CONTINUED

concerned. This is not uniquely a woman's problem, but as the majority of "unfaculty" are female, such a discussion would be very useful to women.

I feel that the workshop covered the areas that are of most interest to me thoroughly, although I feel there should be more women in industrial areas.

Case studies on how to handle male chauvinism might be constructive.

Co-ed workshop. I felt that the women most visible were frustrated, bitter and not willing to fit into a working situation with ease. I came away feeling quite negative and that men were "out to get me", a feeling which I had never fostered on my own. I would not be in favor of supporting another NSF workshop of this kind. Cost/benefit does not warrant further sessions. (However, the food was quite nice.)

Younger women with successful careers. I felt that by the time that I reach 40, I may move up the ladder also. I feel more discussion is needed on how to get a job without experience or how do you get experience?

No.

No.

ANSWERS TO QUESTION #10 ON THE QUESTIONNAIRE FOLLOW:

QUESTION #10: IF YOU ARE UNEMPLOYED OR UNDEREMPLOYED, WOULD YOU HELP DOCUMENT THE PROBLEM BY DESCRIBING BRIEFLY THE REASONS (AS YOU PERCEIVE THEM) FOR YOUR SITUATION AND ANY BARRIERS TO ITS RESOLUTION.

Women in Nursing are making progress very slowly. Further education and an assertive manner are the answer at this time. We are still not financially compensated for the amount of responsibility we have. I am seriously considering transferring my skills into the business aspect of medicine.

My problem is that I have a B.S. in Chemistry. My male friends have no problem finding employment in industry without experience. We all have virtually the same background. I have been told by companies if I could get a job, I would have to make \$3,000 - \$5,000 less in a year. Solution: ERA.

One of my setbacks was not being employed while married. The other is employers want people already trained. Most employers do not want to take the time to train for the particular job.

Since I have young children I wish to spend some time with, I wish I could find work in my area (chemistry) on a part-time basis.

I am a student.

I am a Ph.D. biochemist. I am currently working full time in a grant funded research position. I like my situation very much. I am able to be creative scientifically. I spend some time interacting with students. I do not really want a "normal" academic position. I do not particularly enjoy teaching and I do not think teaching does anything to enhance one's career in research. The problem for a person of my status is the uncertainty of funding. Even though we (Ph.D. level non-faculty researchers) are the backbone of virtually all academic research, the system as a whole barely acknowledges our existence. I look forward to a time when this may change. The problem has already been recognized at the national level - see enclosed reference - it only remains to see what the "system" shall do to resolve it.

I believe I am underemployed; I realize you need to start at the bottom, but staying there is another matter. I have a B.S. degree in Applied Psychology from Georgia Tech. I am presently employed with U.S. Department of Health and Human Services, Office of Investigations as an Investigative Assistant (GS-6). Supposedly my job is to assist the Special Agents during their interviews of witnesses/subjects, assist in case development, etc. However, since there is presently a freeze on federal hiring, we have a clerical problem in our office and my duties for two years have been strictly clerical. The supervisor makes a lot of promises that I'll be helping with cases, yet I have only assisted with one case so far. In other words, I have a title, but I am not performing the job description (except for other duties as assigned).

An education that was too technically oriented left me with a lack of understanding of the role of the "person" in the job market.

I am a student, so I am not subject to unemployment or underemployment. I haven't had any problems with summer jobs in my field. As far as academic discrimination, I go to a women's college, so the discrimination is all in my favor. Spending the past three years in a place where female is the norm has been wonderful. Every woman should have that experience. It has to be experienced to be appreciated.

Because I don't have an Engineering degree, but equivalent training and experience, a B.S. in finance and economics with a minor in computer science - my title was changed to analyst. I fought that - which I would not have (possibly) without the "silent" support of women such as I met at the conference. My title and the other female engineer was changed. However, the one male engineer's (who doesn't have an engineering degree) title was not. We fought, but to date have not succeeded. We are not treated as professionals, but more like secretaries. My supervisor practically clocks the two of us in an out which is not the case for the other engineers. He and the men exchange job opportunities and information which is not passed along to us. We are not part of their network, are not seen as career oriented and not treated equally.

I'm still in school, but will be graduating soon. I've looked at advertisements in the papers and most companies state that they want someone with at least 2-3 years experience or something like that. That could be a problem - where are we supposed to gain experience if they don't give us a chance?

So far, in my career, I think I have been the main barrier. My lack of self-confidence has limited my career. I have not been able to envision myself in higher positions until very recently. The workshop did contribute to building my confidence.

I have a master's degree in microbiology, and I work as a laboratory technician in a R & D chemical lab. Jobs in micro seem to be scarce and low paying. I can make as much or more as a lab technician in a field in which I'm not trained for. My lack of contacts and lack of knowledge of available alternatives could be barriers to my career progress.

I currently am in the co-op program at Tech, so I am not really personally affected by this problem. However, I have noticed that my company has many fewer women than one would expect from looking at statistics regarding women with scientific training. They tell me at work that this is because it is still a new phenomenon, and it will take a while for enough women to move up to equalize things. What I think this means is it will take a while for the older management who still stereotype women to be replaced by people who went to school with women and who can recognize their abilities.

Currently an undergraduate student.

Not applicable.

Being a woman in a male dominated work world where they are told by law they must not discriminate, but find stupid reasons to hire the equally or less equally qualified male over the qualified female. I find this more of a problem in Georgia than Ohio. Being a recent transplant from Ohio, many

employers seem reluctant to check references since it's long distance or inconvenient to write a letter. It's easier to just put my application aside when there are always so many to choose from. The lack of knowledge people have about how similar a physics degree is to an engineering degree in many respects and insist that engineers are the only ones that ever worked hard in college. Due to consistent underemployment, my career has not gotten off the ground yet (5 years since college graduation) so my experience background is weak. My resume looks like I'm a job hopper when it's merely due to always being underemployed and striving to find something satisfying. I can't even get underemployed in this state and I am working as an Olsten temporary.

I am working as a substitute teacher because I have been unable to find a job in a laboratory (even a chemistry lab). There are two main problems I have come up against: (1) people who have a master's degree, who have done graduate work or have a lot of experience apply for the same jobs I do (requiring only a B.S. degree, some with no experience needed). (2) I have been unable to get work experience in a laboratory and some jobs require experience.

At the present time I am still in college, but I will be graduating in a year. I am concerned at this point in gaining some work experience, possibly through internships, in my field. I feel that experience is much more important than specific classes that were taken.

I have not yet graduated from college (June 7). Graduation will, hopefully, remedy some of my employment problems.

I have met my goal of professional biologist, however, I feel that women (as well as many men) are grossly underpaid for their technical abilities. I feel that in the field of biology there is a surplus of trained people and this contributes to the low salaries commonly found.

As a "full-time" wife and mother, I am barely able to work part-time in my field of teaching math. I feel that it will be 7 or 8 years before I can seriously consider full-time work. Until then, I am very much on the periphery of "Women in Science Careers."

I can only speak for myself. I had an extensive science background and taught science for 10 years. After teaching, I really didn't know what options were available to me, if any, for someone with my background and age, to pursue in the field of science other than teaching. Therefore, I totally abandoned science and started in a career totally different.

I am involved with the career counseling of individuals rather than seeking a career for myself in science related or technical areas.

The workshop was invaluable to me because it emphasized the fact that without a higher degree in the sciences there were (1) no worthwhile jobs around and (2) salaries were so low that a higher degree wasn't worth the effort without 100% dedication. I am 42 years old with a bachelors degree and don't have time for dedication. I need a job, a career and money now and will seek it in business where there are more options available to me. No other choice!

As a result of the workshop, I have recently pursued an actuarial career. I have been hired in a trainee position and hope to begin taking the actuarial exams this fall.

After receiving a B.S. degree in Mathematics in 1970 I was unable to find a job in which I could truly use my degree. I remember one potential employer (IBM) asking me if I planned to have children and would my husband mind if I traveled. I was finally hired by an insurance company. I was underemployed as well as underpaid. I could have gotten the same job without a college degree. As soon as I was financially able, I quit. I relocated to Atlanta, got a job as a statistician only to learn my employer had wanted a clerical! Since I was being paid less than the starting salary for a police officer and I could get college incentive pay as an officer, I became one. Eight years later, I'm trying to make a positive career change.

I feel that I am unemployed because of the lack of entry level positions in chemistry fields. Another point, perhaps even stronger is the lack of contacts in my field. At Agnes Scott College there is a very small recruiting schedule and I feel that the lack of personal interviews has seriously hindered my employment state.

I am definitely underemployed for my knowledge of chemical lab techniques and computer programming. However, I think this is due to not having a degree rather than being female. This is also a bad location for chemists. (I am working as a secretary.)

I'm just finishing my degree, have a summer job as an apprentice industrial hygienist and am looking for a permanent job.

I am a full time student.

N/A

Presently, I am job hunting and unemployed. My first barrier is self. I am scared to death, I feel underprepared, and I have to have superior credentials. The second barrier is that I cannot find any guidelines for salaries in my field. The third is that I feel like I have more to offer a company than my work experience would indicate. I am having trouble indicating an exact position.

I am not a woman. However, I have been in a position to help several women (who I felt were deserving) in gaining the experience and self-confidence they lacked, in at least partly becoming winners in their chosen fields. Several keys to success in getting ahead after graduation are (a) getting part-time employment summers while still in school in the field of their choice. Federal or state government is a good training ground (b) request past employers to write recommendation(s) (c) seek employment while carrying past job recommendations with prospective employer. These people have a 10 to 1 advantage over those who loaf summers.

Betty Bearden
President
Papillon, Inc.
2930 Amwiler Court
Atlanta, Georgia 30360
(404) 449-5582

Lorrie Boots
Development Operations Manager
I.B.M.
Department 636, Building 001
P. O. Box 12195
Research Triangle Park, N. C. 27709

Jan Botz
Sales Representative
Dow Corning
5775 Peachtree Dunwoody Rd.
Suite 450-E
Atlanta, Georgia 30342
(404) 992-8378

Laurie Carlton
Development Engineer
Western Electric
Department 82-30
2000 Northeast Expressway
Norcross, Georgia 30071

Kay Cornelius
Senior Aircraft Structures Engineer
Lockheed Georgia Company
86 South Cobb Drive
Marietta, Georgia 30063
(404) 424-4770

Amie Hardman Cotter
Engineer
Southern Bell
100 Perimeter Center Place, Room 397
Atlanta, Georgia 30346
(404) 391-2183

Susan Park Esche
Dye Chemist
Burlington Industries
Rabun Gap, Georgia 30568
(404) 1-746-5311

Joanne Eustace, M.D.
Georgia Tech Clinic
Georgia Institute of Technology
Atlanta, Georgia 30332
(404) 894-2584

Kathy Harrer
Electrical Engineer
Scientific Atlanta
4386 Park Drive
Norcross, Georgia 30093
(404) 925-5914

Julia Howell
Manager Regulatory Submissions
The Coca-Cola Company
310 North Avenue
Room TEC 306B
Atlanta, Georgia 30301
(404) 898-2121

Linda Hsieh
Loss Prevention Consultant
Factory Mutual Engineering
12 Perimeter Center
Atlanta, Georgia
(404) 393-4700

Suzanne Imes
Psychologist
484 Moreland Avenue, N.E., Suite 100
Atlanta, Georgia 30307
(404) 524-3404

Ramona Jones
Associate Manager
Southern Bell
100 Perimeter Center Place, Room 330
Atlanta, Georgia 30346
(404) 391-3430

Marsha King
Attorney
King & King Law Offices
15 Peachtree Street, Suite 808
Atlanta, Georgia 30303
(404) 577-6450

Marilyn Massingill
Environmental Engineer
City of Atlanta
1510 Key Road, S.E.
Atlanta, Georgia 30316
(404) 241-8173

Joyce Myers
Aerospace Engineer
Lockheed-Georgia Company
86 South Cobb Drive
Dept. 7291, Zone 415
Marietta, Georgia 30063
(404) 424-5026

Teresa Newberry
Building Industry Consultant
Southern Bell
100 Perimeter Center Place, Room 228
Atlanta, Georgia 30346
(404) 391-2260

Patricia Powell
Chemist
The Coca-Cola Company
P. O. Drawer 1734, TEC 7
Atlanta, Georgia 30301
(404) 898-3063

Nancy Redgate
Chemical Engineer
Environmental Protection Agency
Atlanta, Georgia 30328
(404) 881-2328

Leagh Sledge
Industrial Engineer
Southern Bell
Tucker, Georgia 30084
(404) 939-9921

Carolyn Smithson
Assistant Treasurer
The Coca-Cola Company
P. O. Drawer 1734
Atlanta, Georgia 30301
(404) 898-3632

Phyliss Stallings
Distribution Engineer
Atlanta Gas Light Company
85 Church Street
Marietta, Georgia 30060
(404) 424-9000

Jane Swit
Econ Analyst II
Georgia Power Company
Box 4545
Atlanta, Georgia 30302
(404) 526-6526

Veronica Glas Wright
President
V. G. Wright & Associates
1100 Spring street, Suite 320
Atlanta, Georgia 30309

PARTICIPANTS IN THE
EXPANDING HORIZONS DINNER

1. Abbey, Mary A.
P.O. BOX 30108
894-2827
SENIOR IN I.E.
2. Butchkovitz, M. L.
P.O. BOX 32648
894-6645/894-3090 wk
SENIOR IN T.E.
3. Alland, Katherine A.
P.O. BOX 30092
894-7189
SENIOR IN E.E.
4. Amerson, Melissa D.
P.O. Box 30146
894-7089
SENIOR IN I.E.
5. Bartlett, Lori
P.O. BOX 30684
894-7117
JUNIOR IN CH.E.
6. Bell, Thea
P.O. Box 31808
894-2490 Leave Message
SENIOR IN TEXT.
7. Bennett, Marla Carol
P.O. BOX 30153
971-3672
SENIOR IN I.E.
8. Benson, Angela D.
P.O. BOX 35684
894-7660
SENIOR IN I.E.
9. Berkman, Ellen
P. O. BOX 31017
JUNIOR IN I.E.
10. Blackmon, Shelvia T.
P.O. BOX 36880
252-6092
SENIOR IN IMGT
11. Booker, Brenda K.
P.O. BOX 35693
344-4553
JUNIOR IN C.E.
12. Boyd, Barbara
P.O. BOX 35436
SENIOR IN IMGT
13. Bradley, N. Elizabeth
P.O. BOX 32571
894-7333
JUNIOR IN C.E.
14. Brown, Victoria L.
P.O. BOX 32432
352-2544 after 3:00 p.m.
JUNIOR IN I.E.
15. Callender, Kimberly
P.O. BOX 32758
894-6141
JUNIOR IN IMGT
16. Carter, Lisa L.
P.O. BOX 31141
894-6101
JUNIOR IN C.E.
17. Carley, Cathlyn M.
P.O. BOX 31114
894-6919
JUNIOR IN CH.E.
18. Choi, Seraphina D.
P.O. BOX 31279
294-0309
JUNIOR IN CH.E.
19. Gilder, Leslie
P.O. BOX 30918
449-7457 (TUES. & THURS)
JUNIOR IN I.E.
20. Coleman, Susan
P.O. BOX 36890
894-7068
JUNIOR IN ICS
21. Cone, Cathleen
P.O. BOX 37274
873-5784
JUNIOR IN E.E.
22. Corey, Ann Marie
P.O. BOX 31252
894-6957 (BETWEEN 8:00 A.M. & 5:00 P.M.)
JUNIOR IN I.M.

23. Cresman, Rena L.
P.O. BOX 34074
894-3000 (A.E. MAIN OFF.)
SENIOR IN A.E.
24. Darsey, Mary Jo
P.O. BOX 33667
894-6938
JUNIOR IN IMGT
25. DeNagel, Diane C.
P.O. BOX 34635
325-1769
JUNIOR IN CHEMISTRY
26. Epps, Marian
P.O. BOX 33006
352-9457
JUNIOR IN IMGT
27. Evert, Janice
P.O. BOX 35124
SENIOR IN E.E.
28. Forthman, Cherie L.
P.O. BOX 36780
JUNIOR IN IMGT
29. Frederick, Lynn
P.O. BOX 35267
876-7806/X3354 MWF
JUNIOR IN M.E.
30. Fuelling, Katherine
P.O. BOX 35654
892-6444
SENIOR IN TEXT. CHEM.
31. FUQUA, JANET
P.O. BOX 34348
JUNIOR IN E.E.
32. Fulginiti, Diane L.
P.O. BOX 35663
894-6960
SENIOR IN I.E.
33. Glaze Karen
P.O. BOX 36005
894-6919
SENIOR IN CHEMISTRY
34. Gonsalves, Katherine
P.O. BOX 30586
894-6950 TUE & THUR
JUNIOR IN C.E.
35. Gould, Helen
P.O. BOX 35200
894-2814
SENIOR IN I.E.
36. Gratz, Dawn M.
P.O. BOX 36178
894-7307
JUNIOR IN M.E.
37. Gregory Cynthia Ann
P.O. BOX 33626
894-7146
SENIOR IN ICS
38. Grey, Terri L.
P.O. BOX 34385
894-7072
SENIOR IN I.E.
39. Griffith, Ellen
P.O. BOX 31422
894-6946
JUNIOR IN I.E.
40. Grundy, Lori A.
P.O. BOX 35027
894-7337
SOPHOMORE IN I.E. (CO-OP)
41. Hashemy, Sedigheh
P.O. BOX 33720
874-3422 after 3:30
SENIOR IN CH.E.
42. Heacker, Cynthia Lynn
P.O. BOX 31277
875-0874 wk or 261-5036 home
SENIOR IN IMGT
43. Hedges, Paula
P.O. BOX 36550
351-0838
SENIOR IN IMGT
43. Henson, Linda
P.O. BOX 36069
894-6965
JUNIOR IN I.E.
45. Herrig, Lynda B.
P.O. BOX 33903
296-5877 early a.m. or late p.m.
JUNIOR IN M.E.

46. Hildebrand, Lauren
P.O. BOX 33575
352-1654/449-5342
SENIOR IN I.E.
47. Hill, Faline
P.O. BOX 33162
894-7333
JUNIOR IN HEALTH SYSTEMS
48. Hill, Marie
P.O. BOX 33165
894-7145
SENIOR IN ENG. SCI. & MECH.
49. Hubbard, Debra
P.O. BOX 30004
351-6923
JUNIOR IN IMGT
50. Hurt, Tracy L.
P.O. BOX 37356
894-7085 Home 894-3592 wk
JUNIOR IN E.E.
51. Illingworth, Karen
P.O. BOX 31311
872-9439
SENIOR IN I.E.
52. Jenkins, GERALYN
P.O. BOX 31732
894-7309
SENIOR IN HEALTH SYSTEMS
53. Jensen, Karen
P.O. BOX 31741
939-8023
SENIOR IN I.M.
54. Hodges, Susan Kennedy
P.O. BOX 31233
255-1682 TUE & THUR
SENIOR IN IMGT
55. Khurana, Renu
P.O. BOX 34193
SENIOR IN E.E.
56. KILROY, MAUREEN
P.O. BOX 32424
894-3090
GRADUATE STUD IN PSYCHOLOGY
57. Knight, Lula
P.O. BOX 30261
885-6537
JUNIOR IN I.E.
58. Knowles, Sherri
P.O. BOX 30303
892-3319 or 872-3788
SENIOR IN CH.E.
59. Kotch, Denise
P.O. BOX 32637
872-4031 AFTER 4:30 T, TH & FR
SENIOR IN E.E.
60. Landesberg, Karen
P.O. BOX 33929
894-6646
JUNIOR IN ICS
61. Lane, Sherri
P.O. BOX 35396
894-2805/292-9080
SENIOR IN HEALTH SYSTEMS
62. LaVean, Pam
P.O. BOX 33947
894-6966/992-4125
JUNIOR IN CH.E.
63. LEWIS, SHELIA
P.O. BOX 33961
894-6085
SENIOR IN CH.E.
64. Litowsky, Helene
P.O. BOX 30408
897-1428
SENIOR IN I.E.
65. Lee, Adrian
P.O. BOX 30859
(615) 329-4004
SENIOR IN I.D.
66. Lewis, Rozilan
P.O. BOX 30027
894-6433/794-6951
JUNIOR IN I.E.
67. Luong, Lo
P.O. BOX 34031
873-3968
SENIOR IN I.E.
68. Maguire, Dawn
P.O. BOX 32587
894-6632
JUNIOR IN PHYSICS
69. Mallory, Karen G.
P.O. BOX 33184
876-3805
SENIOR IN E.E.

- | | |
|---|---|
| 70. Marshall, Shirley A.
P.O. BOX 33586
344-0008
SENIOR IN E.E. | 81. North, Allyce
P.O. BOX 30679
351-3970
SENIOR IN E.E. |
| 71. McKinney, Heather
P.O. BOX 32906
894-6139
JUNIOR IN IMGT | 82. Nottingham, Amy
P.O. BOX 36428
355-6362
JUNIOR IN ARCH. |
| 72. McNease, M. Suzanne
P.O. BOX 31701
894-2830
SENIOR IN IND. MANAGE. | 83. Perkins, Amy D.
P.O. BOX 31946
897-1428
SENIOR IN E.E. |
| 73. Miegel, Nancy
P.O. BOX 32976
SENIOR IN T.E. | 84. Poos, Denise
P.O. BOX 33515
894-6922
SENIOR IN M.E. |
| 74. Milburn, Amelia
P.O. BOX 35546
894-3300 or 6915
SENIOR IN I.M. | 85. Porter, Valarie
P.O. BOX 31107
921-3234
JEPHS UGC |
| 75. Mills, Vickie
P.O. BOX 36200
321-1659
SENIOR IN I.E. | 86. Quinn, Patricia M.
P.O. BOX 35393
894-6139
SENIOR IN IMGT |
| 76. Minor, Gail
P.O. BOX 33913
894-7311
JUNIOR IN CH.E. | 87. Rawlins, Melinda
P.O. BOX 30036
352-9011/872-8483/X2300
JUNIOR IN I.E. |
| 77. Moreland, Margarete
P.O. BOX 33370
872-4133
SENIOR IN CIVIL ENG. | 88. Reich, Pamela E.
P.O. BOX 37666
JUNIOR IN IMGT |
| 78. Murchison, Carla
P.O. BOX 34428
881-6788 X229
SENIOR IN I.E. | 89. Roberts, Yvette
P.O. BOX 34581
894-3700
JUNIOR IN BIOLOGY |
| 79. Murdock, Kimberley A.
P.O. BOX 30464
921-8971 or 894-2604
JUNIOR IN IMGT | 90. Robinson, Veda
P.O. BOX 34633
JUNIOR IN E.E. |
| 80. Nora, Cindy
P.O. BOX 32168
894-6125 after 4:00
JUNIOR IN I.E. | 91. Rowan, Joy
P.O. BOX 37240
894-7320
SENIOR IN PSYCHOLOGY |
| | 92. Seaquist, Doreen
P.O. BOX 34963
352-2836
JUNIOR IN I.E. |

93. Serecigni, Michele
P.O. BOX 34308
352-0990
SENIOR IN I.E.
94. Shanklin, Kathy
P.O. BOX 30269
894-7081 after 6:00 p.m.
SENIOR IN CH.E.
95. Skinner, Kathy A.
P.O. BOX 31351
256-5100 wk
JUNIOR IN IMGT
96. Smith, Leigh Ann
P.O. BOX 33515
451-5961
JUNIOR IN A.E.
97. Smith, Lynda
P.O. BOX 37222
894-6979
SENIOR IN I.M.
98. Soule, Jessica
P.O. BOX 32002
377-6530
JUNIOR IN E.E.
99. Stoyell, Helen
P.O. BOX 31834
X7139
JUNIOR IN CH.E.
100. Tarboy, Catherine
P.O. BOX 37456
876-1863
JUNIOR IN IMGT
101. Thompson, Susan L.
P.O. BOX 37524
355-2569
SENIOR IN E.E.
102. Thornton, Paula Morel
P.O. BOX 36581
894-7570/997-0705
SENIOR IN I.E.
103. Tun, Patricia
P.O. BOX 33661
894-4262
GRADUATE STUD. IN PSYCHOLOGY
104. Tyree, Cecilia
P.O. BOX 31297
X7325
SENIOR IN E.E.
105. Via, Susan M.
P.O. BOX 36765
894-7132/261-8345
SENIOR IN ARCH
106. Vu, Qui
P.O. BOX 37694
872-4245
SENIOR IN E.E.
107. Vu, Phuong Thais Kim
P.O. BOX 30622
237-0442/872-4245
JUNIOR IN E.E.
108. Waddell, April K.
P.O. BOX 34570
351-2783
JUNIOR IN ARCH.
109. Warren, Sheree W.
P.O. BOX 33326
SENIOR IN M.E.
110. Waters, Kim
P.O. BOX 35219
894-7104/894-3932
SENIOR IN IMGT
111. Wall, Kally
P.O. BOX 30059
894-6929
JUNIOR IN ECON.
112. Wallace, Colette
P.O. BOX 36846
894-2600/894-3364
JUNIOR IN IMGT
113. Washington, Simone D.
P.O. BOX 36897
526-7398 wk
JUNIOR IN IM
114. Wassman, Suzan
P.O. BOX 36002
894-2468
JUNIOR IN C.E.

115. West, Martha Denise
P.O. BOX 36990
894-3379
SENIOR IN A.E.
116. Williams, Lynne
P.O. BOX 30378
X 7337 or X 3959
SENIOR IN E.E.
117. Wolf, Janet
P.O. BOX 30440
X 5258 885-9054 room 708
SENIOR IN ICS
118. Zeigler, Judith
P.O. BOX 31489
925-2163
JUNIOR IN CHEM ENG.
119. Zelasky, Beth A.
P. O. BOX 36466
874-6820 / 875-1312
SENIOR IN CH.E.
120. Zimmerman, Margaret Ann
P.O. BOX 32346
894-7120 / 894-3090
SENIOR IN ECONOMICS
121. McGuire, Cathy
P.O. Box 32427
894-7129
SOPHOMORE IN C.E.
122. Murphy, Eileen
P.O. Box 33097
448-4718
JEPHS, UGC

"EXPANDING HORIZONS"

FORUM

November 22, 1981

Participant Comments:

The program last night was just super! It is obvious we have been needing something like that: the response was enthusiastic and the resource people seemed very interested in the concept.

It's nice to see so many young and attractive successful women.

I think this is an excellent program for women who are graduating soon. The forum has made women available for questions that need to be asked before our interviews are made.

It is a very good idea to bring professional women together to share their observations about women in the business world; potential graduates can learn a lot from this.

I really appreciated the honesty of the panelists and the resource women at our table. I learned quite a bit and would attend future similar functions.

I thought this was an excellent idea and enjoyed meeting the professional women who have made it and/or are on their way!

Really great, save the timing - the beginning of the quarter better than toward the end.

These forums are very enjoyable and informative. They need to be continued so all women on campus can realize their capacity. Before now, I had not realized how I responded (non-verbally) affected me and my future-success plans.

Keep up the good work! I particularly enjoyed the panel. There are numerous other topics which could be addressed in future panels.

This forum was very informative, educational, and enjoyable.

Very good and informative! Keep having these available for the women on campus.

Good choice of panelists and participants! Maybe even more concrete "how to's" are helpful.

Great idea! A very good way to talk to businesswomen and what they do.

The dinner and choice of speakers were both excellent!

I have thought and read about many of the issues addressed this evening, and it's exciting to hear successful women articulate some of my own thoughts, as well as to meet Tech women with common concerns. This kind of discussion is valuable and important anywhere, but especially at Tech, where we have very few female role models.

Comments Continued:

Very good selection of speakers!

This is most definitely a program that should be continued. Unfortunately, I would not have realized that until I got here, which is why I encourage you to find funding for the program rather than charge students - it will inevitably discourage many.

The smaller the ratio of women to students the better.

Very impressed!

Are there to be more forums? Can we call on the resource persons if we have employment related questions?

I think it was one of the best things that has happened lately. I think something like this (even if we had to pay) every quarter would be extremely helpful to Tech women.

Very nice to be awarded this opportunity to meet and talk to professional women.

Very good idea!

I enjoyed this opportunity immensely.

"EXPANDING HORIZONS"

FORUM

November 22, 1981

Participant Suggestions:

Longer chance for discussion with representatives.

Warmer dining room!

Bigger auditorium.

The night-time. It could have been earlier in the day so not rushed at the end. The room was cold!

The possible scheduling of similar activities at least once a year, perhaps every quarter.

I think the pressures on students would have been less great had the forum been held earlier in the quarter (i.e. less close to finals). A raised platform for the panel would have been appreciated. Other than those very minor suggestions, the forum was quite enjoyable.

Try having the presentation and dinner at the same time. Regulate the heat in the Student Center Ballroom. It would help if someone could emphasize to panelist a time limit and try enforcing that.

Perhaps the forum could have even more speakers. Their viewpoints and personal experiences were most enlightening and I feel VALUABLE. A more efficient method of integrating the non-speaker resource persons needs to be developed. Their opinions and general viewpoints need to be presented to help initiate interaction. I would enjoy a longer session, an afternoon perhaps noon to 6:00. Have all of the resource people make some sort of presentation/speech/talk.

More people in MANAGEMENT! I would like to meet people in accounting and finance! What about Toby Director!

More speakers, less time for each to talk. It was interesting and informative.

The forum could have more controversial topics. "The Masks Women Wear" was a very good topic. I would like to see and hear a discussion, from more than one source on discrimination of both males and females in the working world. I would also like to see a discussion on just how important is clothing in the office.

Starting earlier would give time for an informal session later.

Allow more time for questions. More information about the researcher's educational backgrounds to see where they have gotten with the degree they obtained (for example, some people's degrees have almost nothing to do with the actual work content of their careers).

Suggestions Continued:

Overall, it was quite enjoyable and informative.

A suggestion might be to have it begin in the afternoon and have more group discussion in groups of about 15 with at least 3 professional women. This way, there would be plenty of time for discussion after the panel discussion. Make sure, as was done, that it is understood that the purpose is to network with men, as well as with women.

It was a very interesting forum. Although, perhaps a bit too long. Perhaps have forums more often and less ambitious. One or two speakers with questions and answers. Or simply dinner and networking at the tables.

If possible, it would be very beneficial to meet more of the professional women - perhaps rotation of the people who wish to speak with additional women. I felt that I would like to speak with many of the participants; and, I was unable to do so.